REPORT RESUMES

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PROGRAMS, '63, A GUIDE TO PROGRAMED INSTRUCTIONAL MATERIALS
AVAILABLE TO EDUCATORS BY SEPTEMBER 1963.
BY- HANSON, LINCOLN F. AND OTHERS
COLUMBIA UNIV., NEW YORK, INST. FOR EDUC. TECH.
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THIS GUIDE LISTS PROGRAMED INSTRUCTIONAL MATERIALS AVIALABLE IN THE FALL OF 1963. THE NUMBER, VARIETY, AND SOURCE OF AVAIALBLE PROGRAMS ARE INDICATED TOGETHER WITH CRITERIA FOR THEIR SELECTION. THE CONTENTS INCLUDE (1) A STATISTICAL SUMMARY OF THE PREVIOUS YEAR'S ACTIVITY, (2) INSTRUCTIONS FOR USAGE, (3) GUIDE TO PROGRAMS, AND (4) APPENDIXES. ANNOTATIONS ON THE PROGRAMS HAVE BEEN PREPARED LARGELY ON THE BASIS OF INFORMATION SUPPLIED BY THE PUBLISHERS. (RS)

ED003135

B-232a

OE-34015-63

(Revised)

PROGRAMS, '63

A Guide to Programed Instructional Materials

Available to Educators
by September 1963

Compiled and Produced by

Information Division
THE CENTER FOR PROGRAMED INSTRUCTION, INC.
in cooperation with the
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education

* * *

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* * *

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PROGRAMS, '63

A Guide to Programed Instructional Materials Available to Educators by September 1963

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Editor
LINCOLN F. HANSON
with the assistance of
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TABLE OF CONTENTS

INTRODUCTION v

STATISTICAL SUMMARY vii

USING "PROGRAMS, '63" xv

GUIDE TO PROGRAMS

Arithmetic 1

Business Education & Economics 80

Games 132

Grammar & Usage 148

Language Arts 205

Modern Language 257

Mathematics

Algebra 308
Applied Mathematics 359
Geometry 379
Logic 388
Mathematics (Miscellaneous) 395
Sets 431
Statistics 454
Trigonometry 475

Medicine 483

Miscellaneous 491

Music 529

Programing 535

Science

Applied Science 551
General Science 575
Biology 640
Chemistry 657
Physics 689
Psychology 697

Social Studies 702
Study Skills 743

APPENDIX A 753

APPENDIX B 756

APPENDIX C 767

AUTHOR INDEX 769

PUBLISHER INDEX 777

SUBJECT MATTER INDEX 793

INTRODUCTION

To assist educators in their selections of programed instruction materials, the Office of Education, in the spring of 1962, commissioned the Center for Programed Instruction to prepare PROGRAMS '62: A GUIDE TO PROGRAMED INSTRUCTIONAL MATERIALS AVAILABLE TO EDUCATORS BY SEPTEMBER 1962 (OE 34015), as the first half of a two-part survey report. The second half, THE USE OF PROGRAMED INSTRUCTION IN U.S. SCHOOLS (OE 34022) followed some months later.

This newest edition, PROGRAMS '63, is the first part of a similar survey for the current year. It lists all materials which will be available in the fall of 1963. It should be noted that samples to be cataloged were chosen by the publishers themselves. The second part will report on how schools have been using materials which have been available for a year or more.

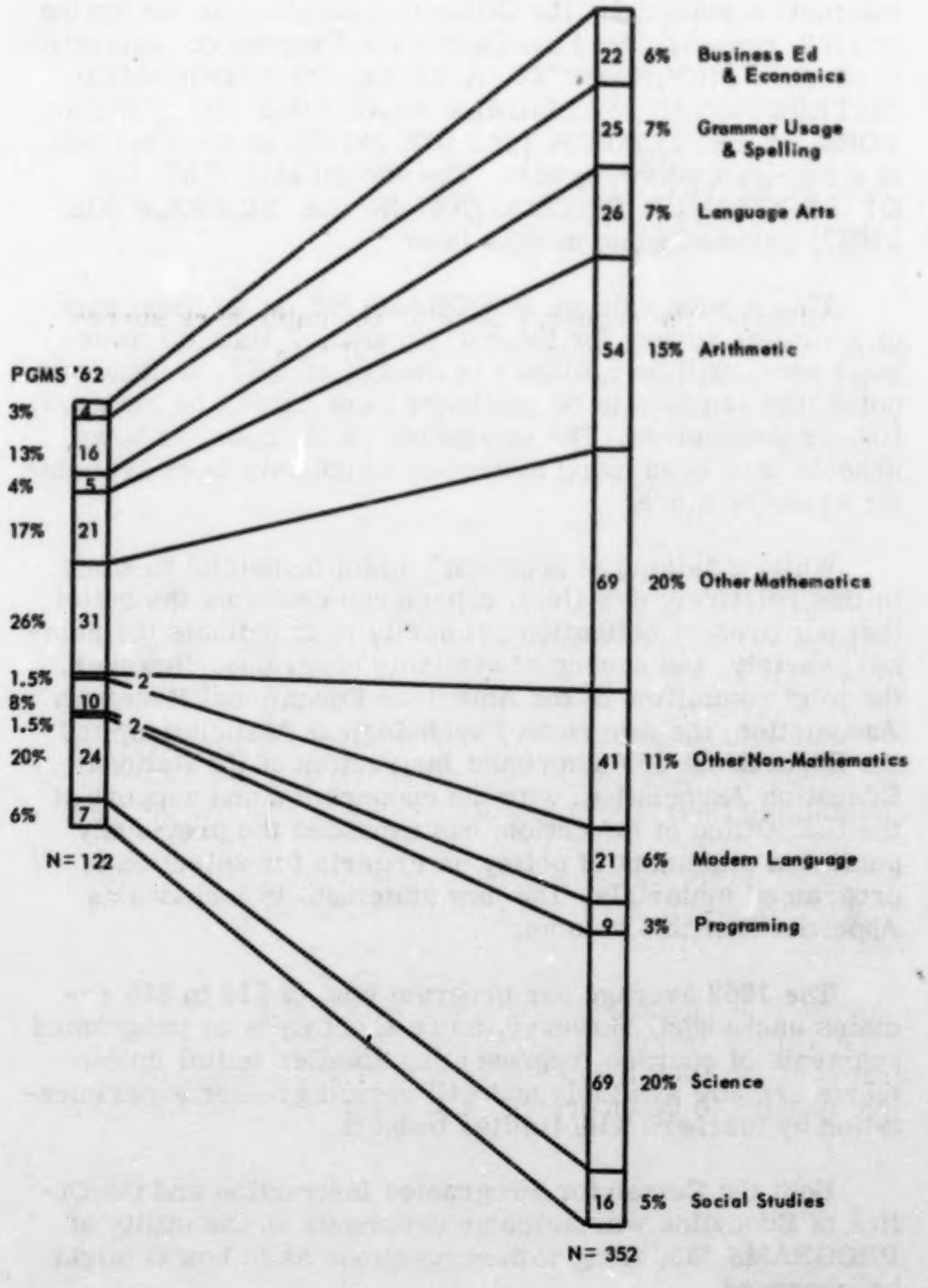
While a "stamp of approval" might be helpful to some in this relatively new field, experience confirms the belief that our present obligation primarily is to indicate the number, variety, and source of available programs. However, the joint committee of the American Educational Research Association, the American Psychological Association, and the Department of Audiovisual Instruction of the National Education Association, with the cooperation and support of the U.S. Office of Education, has expanded the previously published statement of policy on criteria for selection of programed materials. The new statement is included as Appendix B of this volume.

The 1962 average per program cost of $10 to $15 remains unchanged. However, more short units or programed segments of courses, representing smaller initial investments are now available and will permit greater experimentation by teachers with limited budgets.

Both the Center for Programed Instruction and the Office of Education will welcome comments on the utility of PROGRAMS '63, along with suggestions as to how it might be improved.

Figure 1

SUBJECT AREAS OF PROGRAMS AVAILABLE



STATISTICAL SUMMARY

Since Programs, '62 provided a number of first analyses of programed material available, some of the present statistical data have been related to last year's findings. Trends are, of course, premature, but it was felt that the user would want to see at least "two points on the curve."

Following the sequence used on the publishers survey form (Appendix A), Figure 1 shows that this year's 352 programs have the same general subject matter distribution as the 122 of 1962, but with a greater spread clearly emerging. Mathematics, while more than doubling in number of programs available (from 53 to 124) has actually dropped from its strong domination of 44% of last year's available programed materials to a lesser but still major share (35%) of this year's materials. With its wide range of inclusive subjects, from arithmetic through logic and computer programs ("Applied Math"), mathematics still represents the largest single category of programed materials available.

The sciences show a similar relative availability, having almost 3 times as many programs listed this year, and maintaining their previous portion (20%) of available materials.

Most interesting changes are the large absolute gains (in numbers) of programs in Business Education, Modern Language and "Other Non-Math" areas.

In continuing last year's observation of short unitary programs (suggestive of many publishing and curricular possibilities), Figure 2 shows an expanded scale of programs under 1000 frames in length. The 300-400 frame unit appears to be emerging as at least one "module of in-

Figure 2

LENGTH OF PROGRAMS AVAILABLE

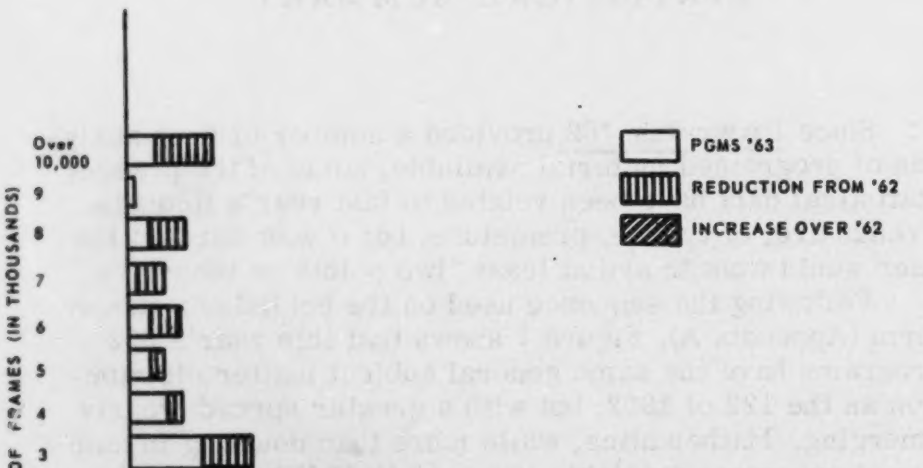
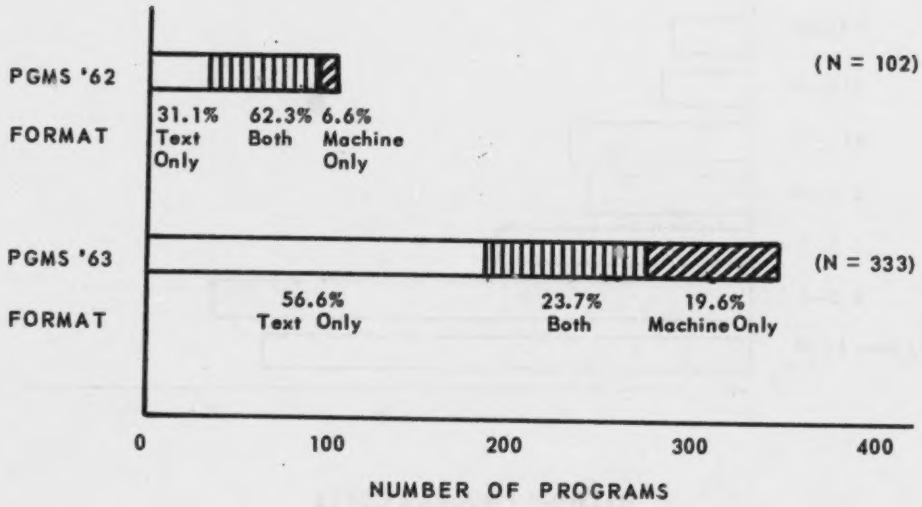


Figure 3

FORMAT AVAILABILITY OF PROGRAMS



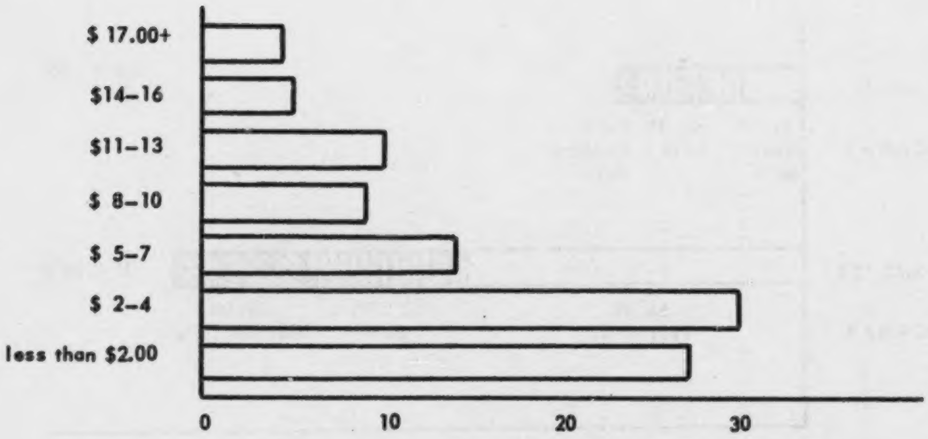
struction," surpassed by no other equally narrow category of program length. For further evidence of this trend to shorter programs, the median length of last year's programs was around 2400 frames; the median length this year is just under 1000 frames.

Figure 3 shows the availability of machine vs. programed formats, with growth in exclusive use of either format the principal change from last year. A far smaller proportion of programs is produced in both machine and text format. Over three-fourths of this larger crop of programs are available in text form; more than half are available only in text form. A substantial 40% of programs are available in machine format (again almost half of them for machines only), while last year's 62% "Available in Both Forms" has shrunk this year to 22%.

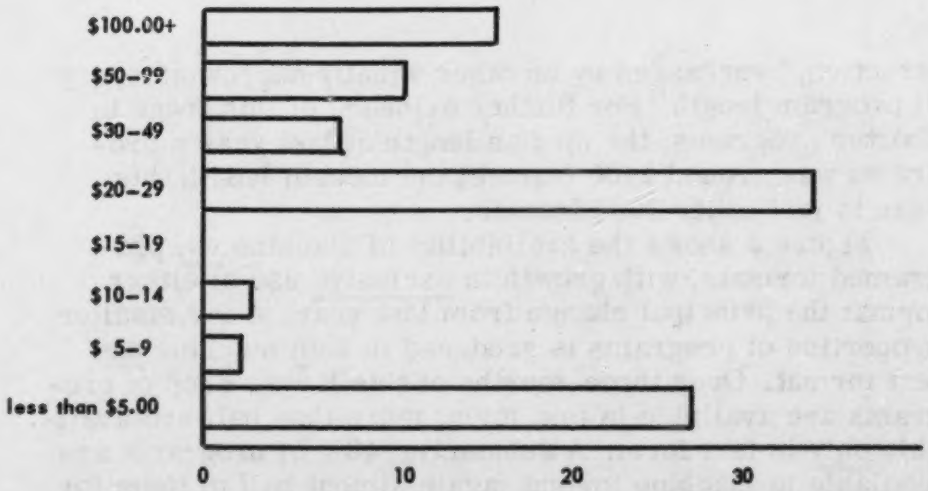
The proportion of programs of all lengths available in unit form has increased slightly; even with the tripling of absolute numbers last year's 20% has now become 23% of programs which are to be available in unit form. (However, 31% of the respondents did not answer this item.)

Figure 4

PROGRAMED TEXT COSTS



MACHINE PROGRAM COSTS



Cost: If one approximates from both length and cost figures, last year's 2500-frame text cost $12.50; roughly 200 frames for a dollar. This year's 1000-frame program appears to cost just under $5.00; therefore, the consumers' one-half cent cost per frame of programs appears remarkably stable in an otherwise hectic area of growth. Figure 4 provides a very rough comparison of the program cost.

Table 1

1963 Frequency and Percent Frequency of Response Modes and Branching

Total number of programs = 352

	all	half or more	less than half	none	
a) Constructed Responses are used	101 28.7%	153 43.5%	25 7.1%	73 20.7%	352
b) Multiple-Choice Responses are used	67 19.0%	19 5.4%	156 44.3%	110 31.2%	352
c) Branching is used	38 10.8%	3 0.8%	49 13.9%	262 74.4%	352

1962 Frequency and Percent Frequency of Response Modes and Branching

Total number of programs = 122

	always	usually	sometimes	never	
a) Constructed Responses are used	10 8.2%	63 51.6%	20 16.4%	29 23.8%	122
b) Multiple-Choice Responses are used	31 25.4%	2 1.6%	80 65.6%	9 7.4%	122
c) Branching is used	10 8.2%	3 2.5%	13 10.6%	96 78.7%	122

Types of Response used in programs of either text or machine formats are compared with last year's findings in Table 1. In contrast with the decreasing availability of text *or* machine formats for the same program, it is here that one may find evidence for a growing flexibility in what were once regarded as hard "schools" of program writing. Constructed Responses have increased in the "always used" category "never" for using Constructed Responses. The use of the Multiple Choice Responses is proportionately less, showing decrease both in the "always," and "never" categories and an increase in the "sometimes" used category. Branching seems to show the most stable proportions of all, being used "always," "never," and "usually" by very nearly the same percentages as last year.

In another matter of format, repeated requests within a program, as in reference use. While 30% of programs make no provision at all for easy references, 10% have *both* a Table of Contents *and* an Index.

Units tests are now available for almost 40% of the 1963 programs, final tests are available for 46%, but diagnostic ("pre") tests are acknowledged by only 14% of the program suppliers. It would seem that there still remains some doubt on the part of program producers as to the nature and purpose of diagnostic tests. The fact that claims made for *gains* as a result of the use of a program may be meaningless *without* such pretesting of knowledge covered by the program, plus the time saved in diagnosing areas not needed by some students, would seem to make such tests more desirable—and eventually, perhaps, more available.

Grade Level: Still only one program seems to be all that is available for (developed upon) the kindergarten level, but grades 1-6 have helped in the development of 16% of the programs available—many of which eventually are used above this range. Junior High School subject matter still commands the largest attention of the programers—with 18% of the programs currently developed in these grades. As was true last year, many of these will be found useful above *and* below grades seven and eight; the vast majority would appear useful for reasonably bright sixth graders. Nine per cent of this year's programs are college developed. Over a third of *all* the programs indicate that even in early trials they have been used on a greater variety of students than was orginally intended. Last year's graph on intended grade usage was compounded of so many extrapolations that comparison is difficult; however, the general pattern seems to have changed but little. Last year, publishers listed Intended Grade Level—this year we have concentrated on the characteristics of the population upon whom the program was developed and tested. Such data would seem a safer base from which the user may do his own extrapolating, in either direction. As a further encouragement to this use of programs "out of grade," 7% of the programs were actually developed on populations for whom they were intended, and 5% were given to similar student populations, but 9% were given to populations above the intended level, and 13% of the programs were successfully tested on populations completely different from those for whom the programs were developed.

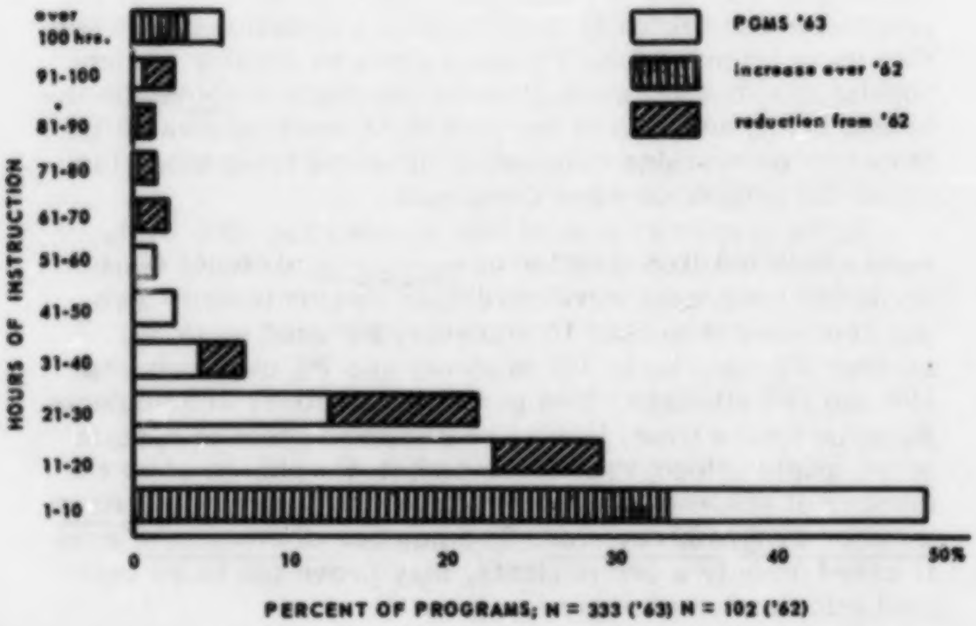
In the matter of size of test populations, 83% of the respondees omitted mention of number of students upon whom the programs were developed and/or tested. Two per cent used less than 15 students, 3% used up to 30, another 3% used up to 100 students and 7% used between 100 and 200 students. Two per cent used over 300 students. At some future time, lest mere numbers seem to contain some magic in program development, we plan to show the number of students used for each testing which resulted in a major program revision. The number of revisions, even if based on only a few students, may prove the more relevant information to relay to users.

Time to complete each program (Figure 5), while similar to last year's distribution, has apparently dropped an average of almost 10 hours through the middle length programs (note reduction from 1962 of 11-20, 21-30, 31-40 hour percentages). Fifty-four per cent of program data sheets showed time figures to be based "partly on data." Ten per cent admit to guessing, another 11% declare their figures based "entirely on data" but give no standard deviation, while 16% provided a Mean Program Completion Time complete with standard deviation.

With such items we hope to help shape the data supplied by publishers to educators, not in the false notion that any of our indices, like error rate, cannot be manipulated at will, but rather in hope that the most sincere attempts will be made to provide simple, yet precise and meaningful data in the careful development of programed materials. We would especially encourage thoroughness with which programs are student developed and tested.

Figure 5

INSTRUCTIONAL TIME PER PROGRAM
(from publishers' estimates)



Possibly, in this area alone may come both the most unique as well as the major contribution of programed instruction to the education of students. The value to teacher education is elsewhere more appropriately discussed, and may even be the larger overall effect, nevertheless, when the student is heard, not in the selection of objectives of teaching, but in determining the teacher's success in achieving objectives, the corrective "feedback" of programs is perhaps unequalled in achieving, measuring and retaining successful communication.

SOME SUGGESTIONS FOR USING "PROGRAMS, '63"

One of the important distinctions a potential user may want to make in connection with programs on this list is whether or not a program is available for use without a teaching machine. In the vast majority of cases this is so. The reader is further directed to check the following items as discriminative clues for machine programs.

1. If listed first "For use in________machine" (a few publishers appear willing to sell separate units of machine material, and their responses are thus entered).

2. If listed "specifically" or "only for________machine.

3. And perhaps the ultimate criterion—if a machine is mentioned under "Additional Material Required." (Cost data were requested, but not always supplied, for this item.)

Each entry consists of the following:

Subject matter—and, where supplied, approximate intended academic level. "Open" simply indicates that the content is the sole determinant of level.

Title, Author, and Publisher;
slightly edited for the format of this publication.

Text description usually has # of frames, cover, # of pages, and page size to give some picture of the nature of the material to be handled.

NOTE: Number of pages, number of frames and all cost figures should be considered only as order-of-magnitude figures; many suppliers so indicated. In supplying the cost of figures, many refused even to estimate; a blank or "?" has been inserted to so indicate (the reader may wish to make his own rough guess from comparisons with similar frame and page count).

Even more than was true last year, many subjects are offered in unit form; in some cases the context, in other cases sheer bulk, was the decisive factor; in either case such separate units are listed where available. Very often two consecutive programs (*Algebra I and II*; *English 2600* and *English 3200*) are listed on the same page, although they are usually available as separate units. If in doubt, contact the publisher.

Teacher's Manual and Test availability have been slightly edited for simplest indication to the user; all final availability (here projected as of September) should be ultimately checked with the publisher.

The Form of Response and Use of Branching are the simplest summary we could make of a small chart on the questionnaire, which contained far-from-uniform entries. In the future we hope to develop a form which can be reproduced directly.

Intended Population is indicated at the very top right of the page. New this year—the Developmental and/or Field Test Population(s), upon which the program was developed, or first field tested, is considered a more meaningful guide to potential users. Data for this item will vary widely; our eventual hope is that publishers will shortly include an age group, intelligence level and other distinguishing characteristics of these populations so that users may extrapolate with some confidence to their own student backgrounds and abilities. Ideally, the number of *student data based* revisions should be more meaningful than mere numbers of students in a field test *without* revision.

Prerequisites are usually quoted directly. Additional Material Required was intended to bring out the need for anything, other than the programed material itself, necessary to start a student to work (with his own pencil).

The time required to complete programs (Average Time) varies from complete data with standard deviation given through estimates to a simple guess." The few responses with no check at all for this item have been listed as estimated. In the future the plan is to supply more test data. The few complete examples supplied by the present respondents have this year been included in order to encourage this easy and precise additional information.

The final item is simply to indicate the number of sample pages supplied (or selected from in the requested proportion of one page per thousand frames, or one page per 500 "scrambled" pages, per program). The greatest problems were presented by copy supplied by programers using Branching techniques; the nature of Branching requires turning from one page back or forward as indicated; some samples have been laid out in the hope of showing this feature, even at the expense of partial page extractions.

A last word: the Center is interested in all suggestions aimed at improving future editions. Any suggestions as to the kinds of information that will help the educator to evaluate programs of the type listed in this "guide" are respectfully solicited. The evaluation of programs is largely subjective at present and may remain so for some time to come. (One school system has evolved the ingenious list of questions for salesmen contained in Appendix C.) From the Center's point of view any information which can be supplied to users enabling them to form their own opinions is highly desirable.

L.F.H.

692-898 O-63—2

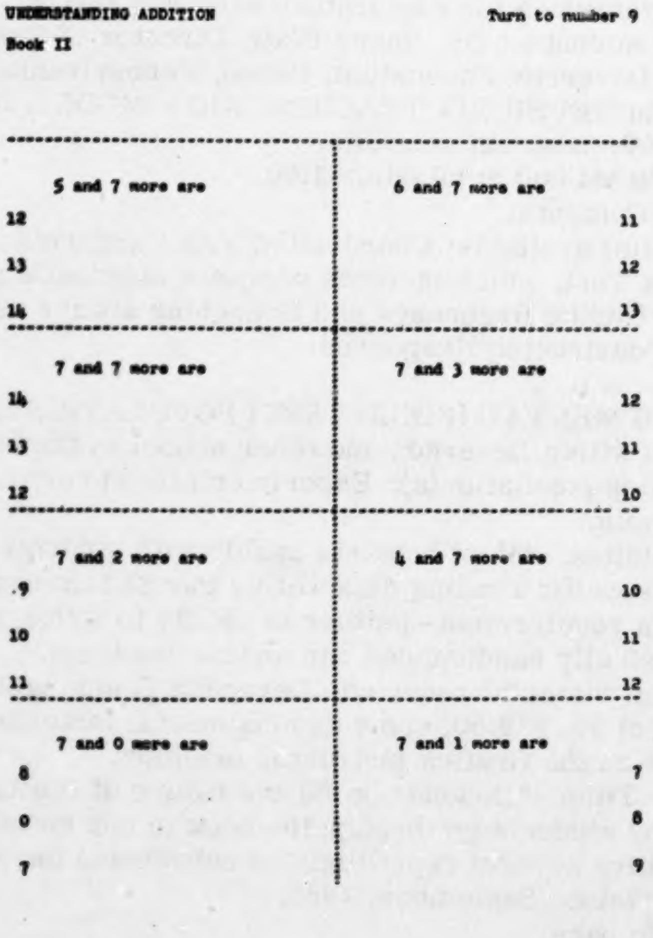
ADDITION AND SUBTRACTION
A Set of 11 Automated Workbooks
Prepared through the facilities of the Devereux Foundation.
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania.

Programed workbooks, 1584 frames, paperback, 18 pages each book, 7" x 11". "Available only to special education facilities for exploratory use. For further information contact Dr. Henry Platt, Director of Training, The Devereux Foundation, Devon, Pennsylvania."
For use in DEVEREUX TEACHING AID - MODEL 50, $89.50, program reusable.
Teacher's Manual available, $1.00.
Table of Contents.
Unit Test(s) available; Coordinated with California Achievement Test, which includes adequate diagnostic profile.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): Both within Devereux and other school systems.
Other using population(s): Experimentally in normal grade schools.
Prerequisites: "Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement—neither is ability to write, so physically handicapped can and do use them."
Additional material required: Devereux Teaching Aid - Model 50, $89.50; some developmental material available on the Graflex Instructor machine.
Average Time: "Depends on IQ and nature of limitations. Many students go through the book in one hour but require several repetitions on subsequent days."
Next Revision: September, 1963.
(1 sample page)

ARITHMETIC

ADDITION AND SUBTRACTION
Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:



UNDERSTANDING ADDITION Turn to number 9
Book II

5 and 7 more are 12 13 14	6 and 7 more are 11 12 13
7 and 7 more are 14 13 12	7 and 3 more are 12 11 10
7 and 2 more are 9 10 11	4 and 7 more are 10 11 12
7 and 0 more are 8 0 7	7 and 1 more are 7 8 9

ELEMENTARY ARITHMETIC
Addition I and Subtraction I
RUTH B. ROSENBERG, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.) (including three programs of choice for Subtraction I); programs reusable, 200 frames each, $2.00-$2.50. (For Addition I, machine may be marketed in retail channels at this $20 combination price including 3 or 4 programs.)

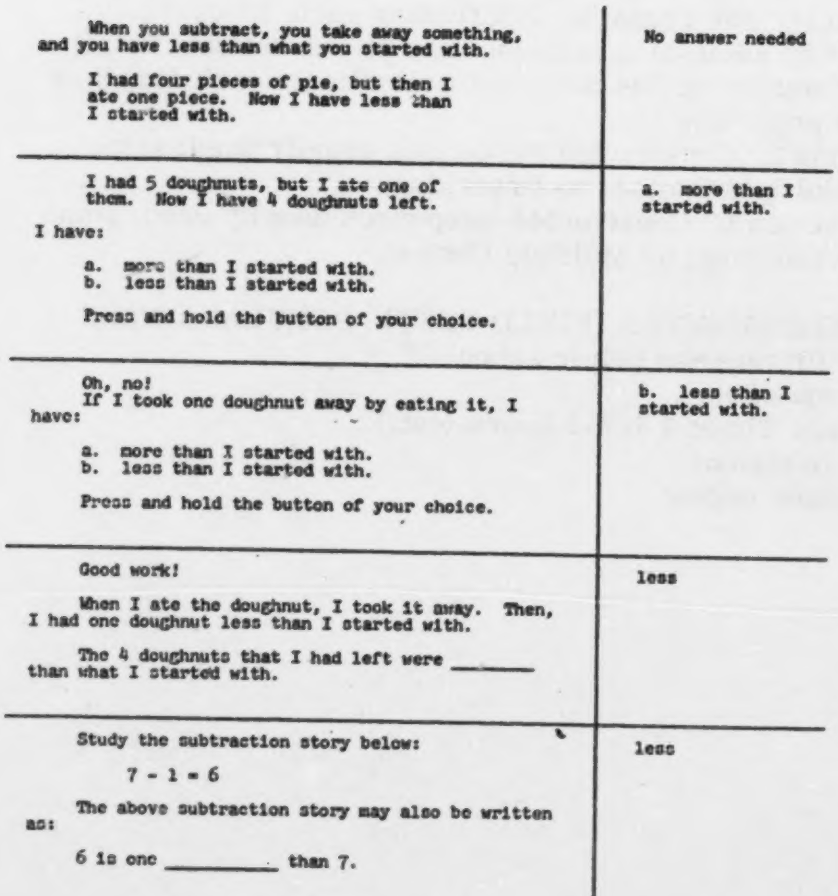
Addition I: Constructed Responses usually used; some Multiple Choice; no Branching.

Subtraction I: Constructed Responses usually used; some Branching; no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Private and public schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(2 sample pages)

ARITHMETIC

ELEMENTARY ARITHMETIC
Rosenberg; HONOR PRODUCTS
2 sample pages:



When you subtract, you take away something, and you have less than what you started with. I had four pieces of pie, but then I ate one piece. Now I have less than I started with.	No answer needed
I had 5 doughnuts, but I ate one of them. Now I have 4 doughnuts left. I have: a. more than I started with. b. less than I started with. Press and hold the button of your choice.	a. more than I started with.
Oh, no! If I took one doughnut away by eating it, I have: a. more than I started with. b. less than I started with. Press and hold the button of your choice.	b. less than I started with.
Good work! When I ate the doughnut, I took it away. Then, I had one doughnut less than I started with. The 4 doughnuts that I had left were _______ than what I started with.	less
Study the subtraction story below: 7 - 1 = 6 The above subtraction story may also be written as: 6 is one _________ than 7.	less

When you count, you may use counting words. Each counting word stands for the number that you count. Zero, one, two, three, four, five, six, seven, eight, and nine are all counting ____________.	words
Each counting word has a counting figure that also stands for the number that you count. Zero, one, two, three, four, five, six, seven, eight, and nine are counting ____________. 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 are counting ______________.	1. words 2. figures (numbers)
Pictures, too, can show numbers. The Indians in North America used pictures to show numbers. Each sun showed one day; so, three suns showed three ______________. (Illustration)	days
You can write counting words and figures to show numbers; so you do not need to draw pictures. Each time you count a number of things, you use the counting words, or the figure; to tell the number that you have counted. The counting word three has a figure, or the number 3, that stands for the number of things that you count.	No answer needed
To show the number that you count, you may use a counting word or a figure. How many kites do you see here? You may write the counting word, or the figure, to stand for the number of kites. (Illustration)	eight (8) (The counting word eight has the figure 8.)

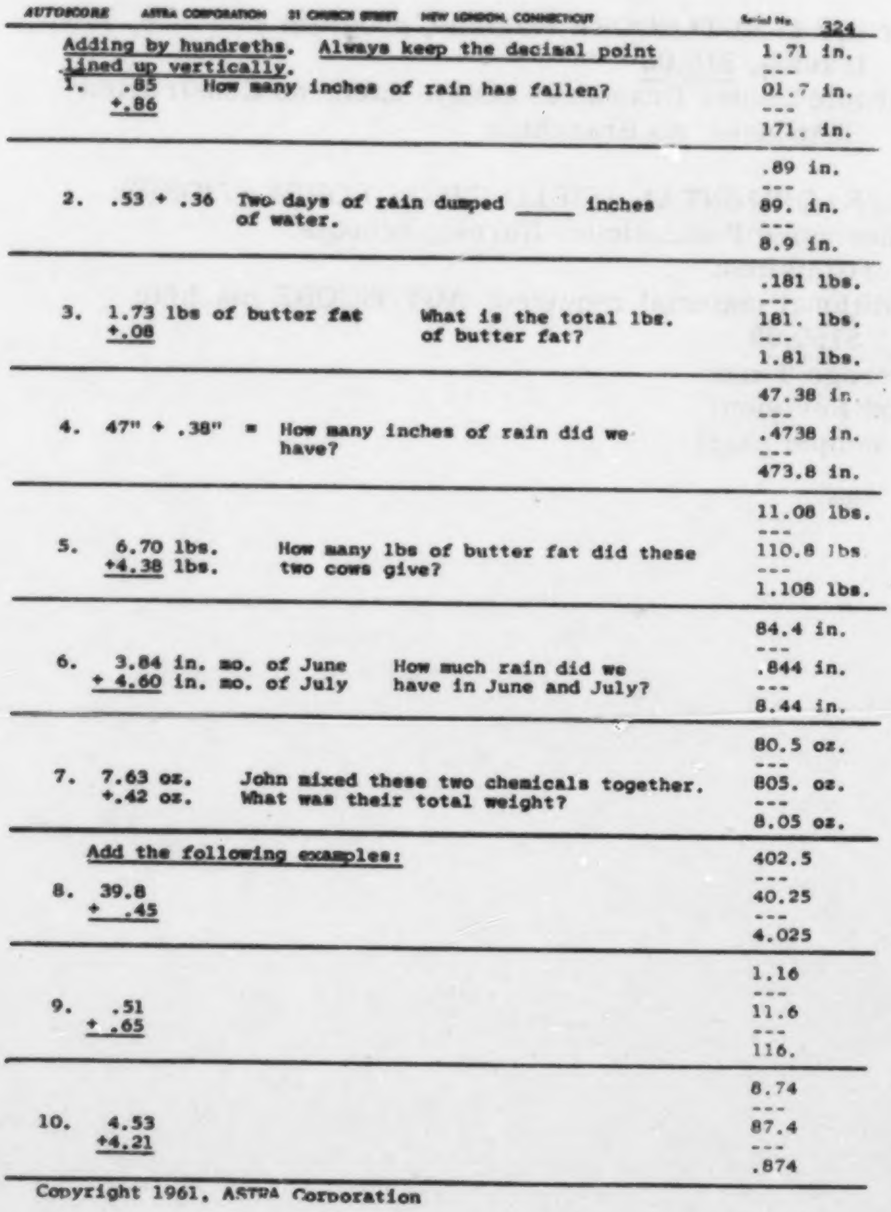
ELEMENTARY ARITHMETIC SERIES: ADDITION AND SUBTRACTION FACTS
Using Numbers 1-10
DONALD T. TOSTI
DONALD BERTHOLOMEY, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION, 575 Lexington Avenue, New York 22, N.Y.

Programed text, 1,375 frames, paperback, 303 pp., 8 1/2" x 11", $11.00.
For use in MIN/MAX machine, $25.00; program reusable, $10.00.
Teacher's Manual: General Manual available for all TMI-Grolier programs.
Final Test included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Average age 5.5 years; average school grade: .9."
Prerequisites: "Ability to identify groups of objects up to ten, and to be able to recognize the numerals 1 through 10."
Average Time: 12-16 hours (based entirely on data); standard deviation, 4.16 hours.
Next Revision: December, 1963.
(1 sample page)

ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: ADDITION AND SUBTRACTION FACTS
Using Numbers 1-10
Tosti, Bertholomey; TEACHING MATERIALS CORP.
one sample page:



AUTOSCORE ASTRA CORPORATION 21 CHURCH STREET NEW LONDON, CONNECTICUT Serial No. 324

Adding by hundreths. Always keep the decimal point lined up vertically.

1.	.85 +.86	How many inches of rain has fallen?	1.71 in. --- 01.7 in. --- 171. in.
2.	.53 + .36	Two days of rain dumped _____ inches of water.	.89 in. --- 89. in. --- 8.9 in.
3.	1.73 lbs of butter fat +.08	What is the total lbs. of butter fat?	.181 lbs. --- 181. lbs. --- 1.81 lbs.
4.	47" + .38" =	How many inches of rain did we have?	47.38 in --- .4738 in. --- 473.8 in.
5.	6.70 lbs. +4.38 lbs.	How many lbs of butter fat did these two cows give?	11.08 lbs. --- 110.8 lbs --- 1.108 lbs.
6.	3.84 in. mo. of June + 4.60 in. mo. of July	How much rain did we have in June and July?	84.4 in. --- .844 in. --- 8.44 in.
7.	7.63 oz. +.42 oz.	John mixed these two chemicals together. What was their total weight?	80.5 oz. --- 805. oz. --- 8.05 oz.

Add the following examples:

8.	39.8 + .45	402.5 --- 40.25 --- 4.025
9.	.51 + .65	1.16 --- 11.6 --- 116.
10.	4.53 +4.21	8.74 --- 87.4 --- .874

Copyright 1961, ASTRA Corporation

ARITHMETIC Elem.

DECIMALS
ASTRA STAFF
Published by ASTRA
19 Burton Avenue, Norwich, Connecticut

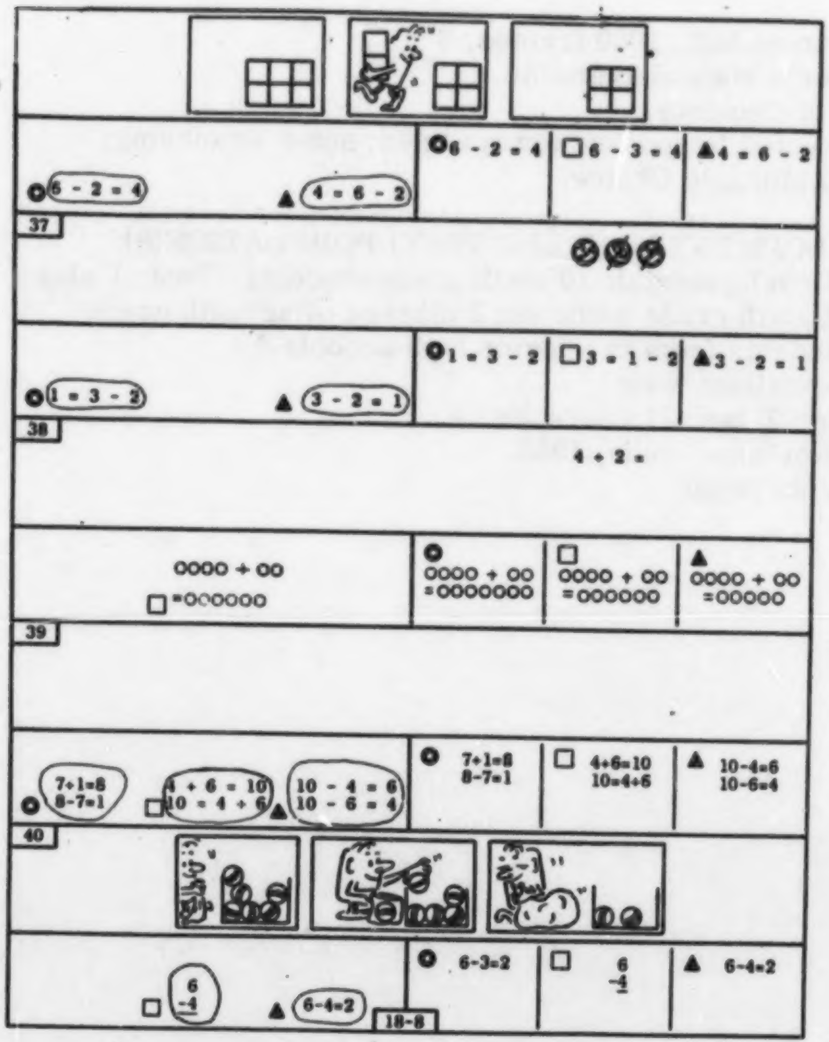
For use in AUTOSCORE machine; program reusable, 760 frames, $15.00

Multiple Choice Responses always used; no Constructed Responses; no Branching

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Other using Populations: Nursing schools.
Prerequisites:
Additional material required: AUTOSCORE machine, $150.00
Average Time:
Next Revision:
(1 sample page)

ARITHMETIC

DECIMALS
Astra Staff; ASTRA
one sample page:


37
6 - 2 = 4
4 = 6 - 2
6 - 2 = 4
6 - 3 = 4
4 = 6 - 2
38
1 = 3 - 2
3 - 2 = 1
1 = 3 - 2
3 = 1 - 2
3 - 2 = 1
4 + 2 =
0000 + 00
=000000
0000 + 00
=0000000
0000 + 00
=000000
0000 + 00
=00000
39
40
7+1=8
8-7=1
4 + 6 = 10
10 = 4 + 6
10 - 4 = 6
10 - 6 = 4
7+1=8
8-7=1
4+6=10
10=4+6
10-4=6
10-6=4
6
-4
6-4=2
18-8
6-3=2
6
-4
6-4=2

DECIMALS AND PERCENT
WILLIAM HAUCK, Mathematics Dept.
J. WILLIAM MOORE, Education Dept.
WENDELL SMITH, Psychology Dept., all of Bucknell University.
Published by McGRAW-HILL BOOK COMPANY, Inc., 330 West 42nd Street, New York City.

Programed text, 1000 frames, $____.
Teacher's Manual available.
Table of Contents.
Constructed Responses always used; some Branching; no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental: 10 sixth grade students. Test: 1 class of sixth grade students; 2 classes of seventh grade students from two junior high schools."
Prerequisites: None
Average Time: 21 hours (est.).
Next Revision: June, 1963.
(1 sample page)

ARITHMETIC

DECIMALS AND PERCENT
Hauck, Moore, Smith; McGRAW-HILL BOOK CO.
one sample page:

(Preliminary Version)

Q13-11 567 ÷ 100
To work the above problem you could move the decimal point in 567 ___?___ decimal places to the ___?___ and get ___?___.

A13-11 two; left; 5.67

Writing Zeros in the Dividend to Divide by 10, 100, 1000, etc.

Q13-12 Work this problem: 6.1 ÷ 1000, by long division until the remainder is zero. Show your work.

A13-12

$$\begin{array}{r} .0061 \\ 1000\overline{)6.1000} \\ \underline{6\,000} \\ 1000 \\ \underline{1000} \end{array}$$

Q13-13 Rather than work this problem: 6.1 ÷ 1000 = .0061 by long division, you could have moved the decimal point in 6.1, ___?___ decimal places to the ___?___ to get ___?___.

A13-13 three; left; .0061
. . .

ARITHMETIC Elem.

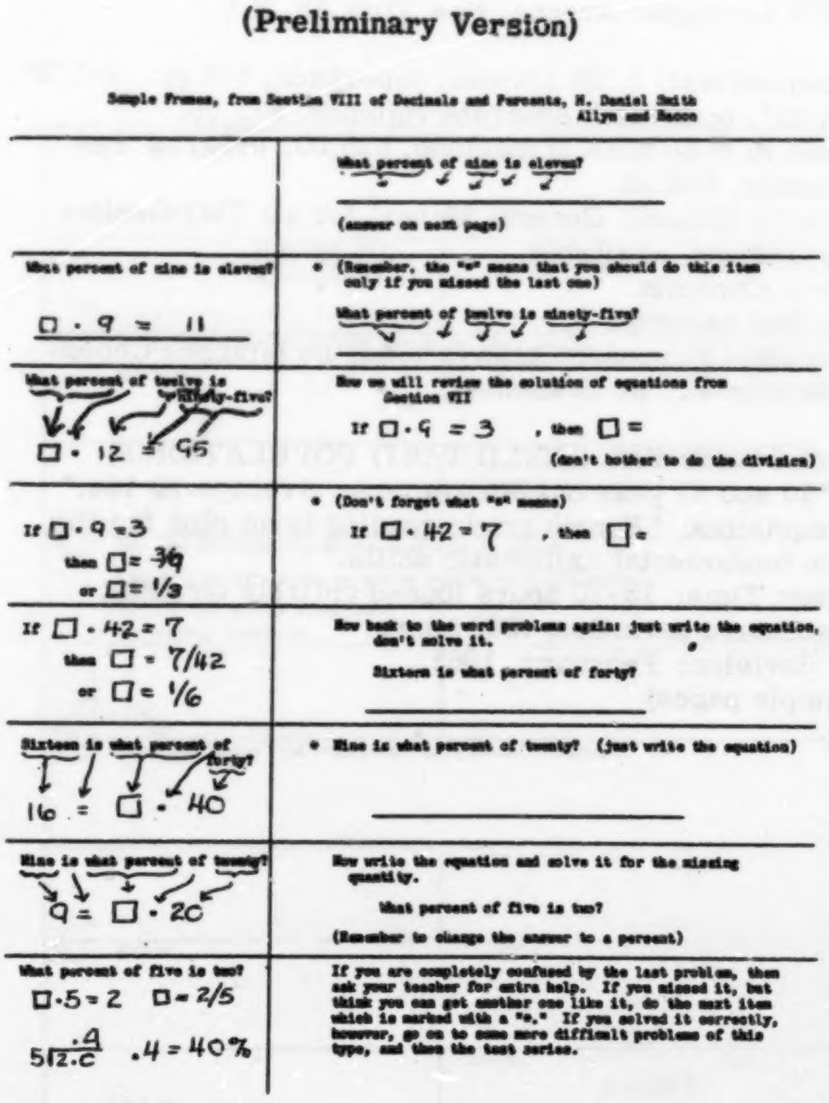
DECIMALS AND PER CENTS
M. DANIEL SMITH, Coordinator of Self Instruction, Earlham College.
Published by ALLYN AND BACON, Inc.
150 Tremont St., Boston 11, Massachusetts

Programed text, 1000 frames, paperback, 176 pp., 8-1/4" x 11", $____.
Teachers Manual.
"Test items included in program at end of each of 8 sections."
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental 6 Field test of preliminary edition ca. 125."
Prerequisites:
Average Time: 10 hours (est.).
Next Revision: Not determined.
(1 sample page)

ARITHMETIC

DECIMALS AND PER CENTS
Smith; ALLYN AND BACON
one sample page:



(Preliminary Version)

Sample Frames, from Section VIII of Decimals and Percents, H. Daniel Smith
Allyn and Bacon

	What percent of nine is eleven? (answer on next page)
What percent of nine is eleven? $\square \cdot 9 = 11$	* (Remember, the "*" means that you should do this item only if you missed the last one) What percent of twelve is ninety-five?
What percent of twelve is ninety-five? $\square \cdot 12 = 95$	Now we will review the solution of equations from Section VII If $\square \cdot 9 = 3$, then $\square =$ (don't bother to do the division)
If $\square \cdot 9 = 3$ then $\square = 3/9$ or $\square = 1/3$	* (Don't forget what "*" means) If $\square \cdot 42 = 7$, then $\square =$
If $\square \cdot 42 = 7$ then $\square = 7/42$ or $\square = 1/6$	Now back to the word problems again: just write the equation, don't solve it. Sixteen is what percent of forty?
Sixteen is what percent of forty? $16 = \square \cdot 40$	* Nine is what percent of twenty? (just write the equation)
Nine is what percent of twenty? $9 = \square \cdot 20$	Now write the equation and solve it for the missing quantity. What percent of five is two? (Remember to change the answer to a percent)
What percent of five is two? $\square \cdot 5 = 2 \quad \square = 2/5$ $\begin{array}{r} .4 \\ 5\overline{)2.0} \end{array} \quad .4 = 40\%$	If you are completely confused by the last problem, then ask your teacher for extra help. If you missed it, but think you can get another one like it, do the next item which is marked with a "*." If you solved it correctly, however, go on to some more difficult problems of this type, and then the test series.

ELEMENTARY ARITHMETIC SERIES: DECIMAL NUMBERS
POLO C. DE BACA
DONALD T. TOSTI, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

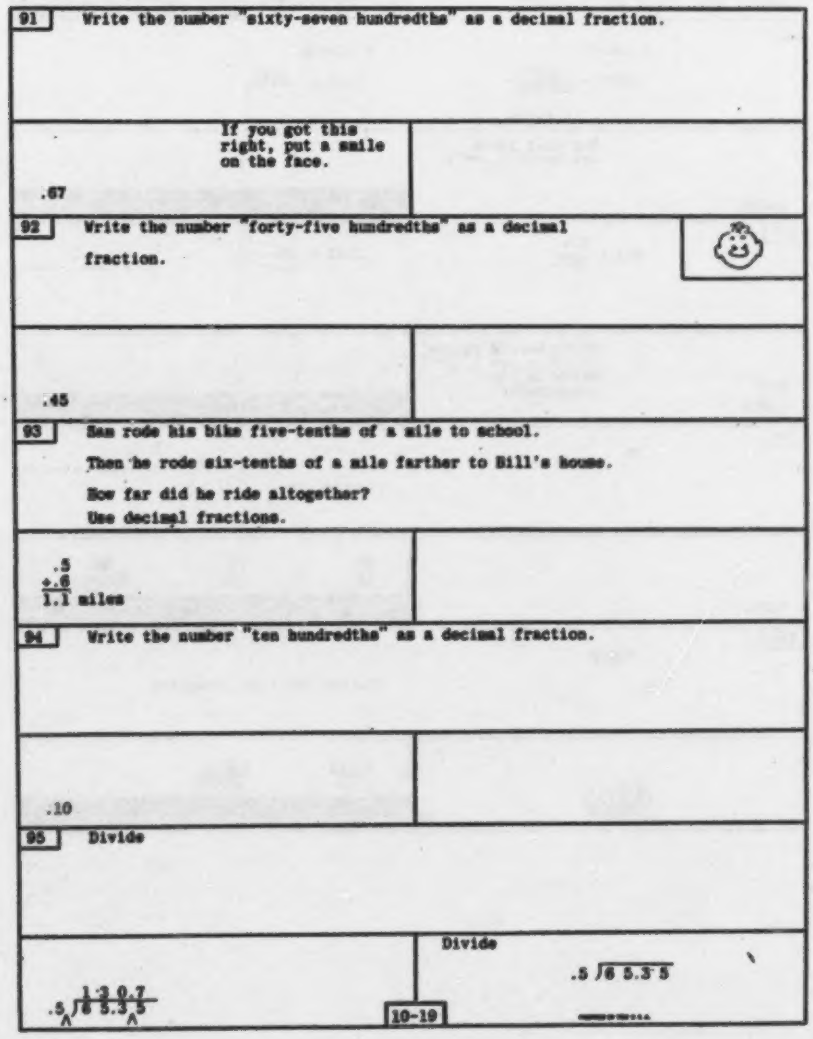
Programed text, 2,735 frames, paperback, 564 pp., 8-1/2" x 11", bound in 2 separate volumes, $13.50.
For use in MIN/MAX II machine, $25.00; program re-usable, $12.50.
Teacher's Manual: General Manual for all TMI-Grolier programs available.
Table of Contents.
Final Test included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "10 and 11 year old 8th graders. Average IQ 104."
Prerequisites: "Fourth grade reading level plus facility in fundamental arithmetic skills."
Average Time: 15-20 hours (based entirely on data); standard deviation, .868 hours.
Next Revision: February, 1963.
(2 sample pages)

ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: DECIMAL NUMBERS

De Baca, Tosti; TEACHING MATERIALS CORPORATION
2 sample pages:



91 Write the number "sixty-seven hundredths" as a decimal fraction.

If you got this right, put a smile on the face.

.67

92 Write the number "forty-five hundredths" as a decimal fraction.

.45

93 Sam rode his bike five-tenths of a mile to school.
Then he rode six-tenths of a mile farther to Bill's house.
How far did he ride altogether?
Use decimal fractions.

$$\begin{array}{r} .5 \\ +.6 \\ \hline 1.1 \end{array}$$ miles

94 Write the number "ten hundredths" as a decimal fraction.

.10

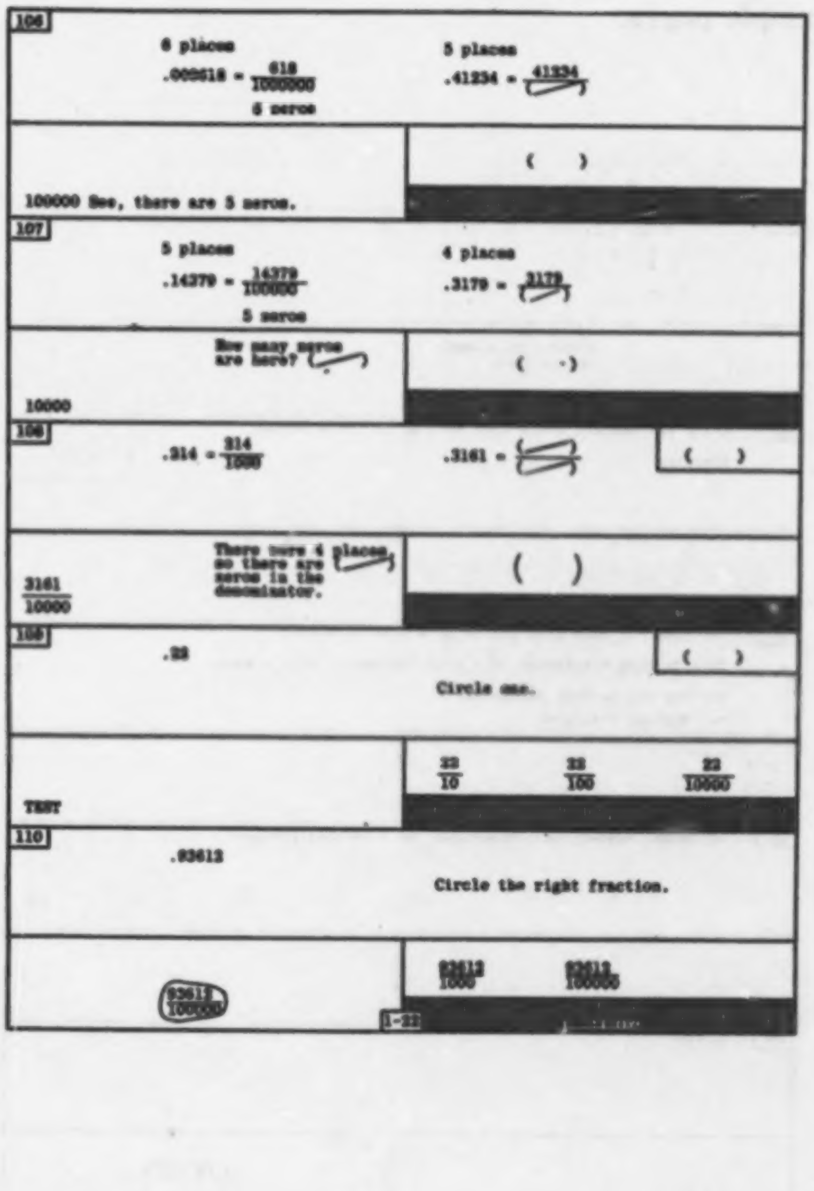
95 Divide

$$.5_{\wedge}\overline{)6\,5.3_{\wedge}5}^{\;1\,3\,0.7}$$

Divide

$$.5\overline{)6\,5.3\,5}$$

10-19



106

6 places

$.000618 = \frac{618}{1000000}$

6 zeros

5 places

$.41234 = \frac{41234}{(\quad)}$

( )

100000 See, there are 5 zeros.

107

5 places

$.14379 = \frac{14379}{100000}$

5 zeros

4 places

$.3179 = \frac{3179}{(\quad)}$

How many zeros are here? ( )

( )

10000

108

$.314 = \frac{314}{1000}$

$.3161 = \frac{(\quad)}{(\quad)}$

( )

There were 4 places, so there are ( ) zeros in the denominator.

( )

$\frac{3161}{10000}$

109

.22

( )

Circle one.

$\frac{22}{10}$ $\frac{22}{100}$ $\frac{22}{10000}$

TEST

110

.93612

Circle the right fraction.

$\frac{93612}{1000}$ $\frac{93612}{100000}$

$\frac{93612}{100000}$

1-22

ARITHMETIC Jr. H.S.

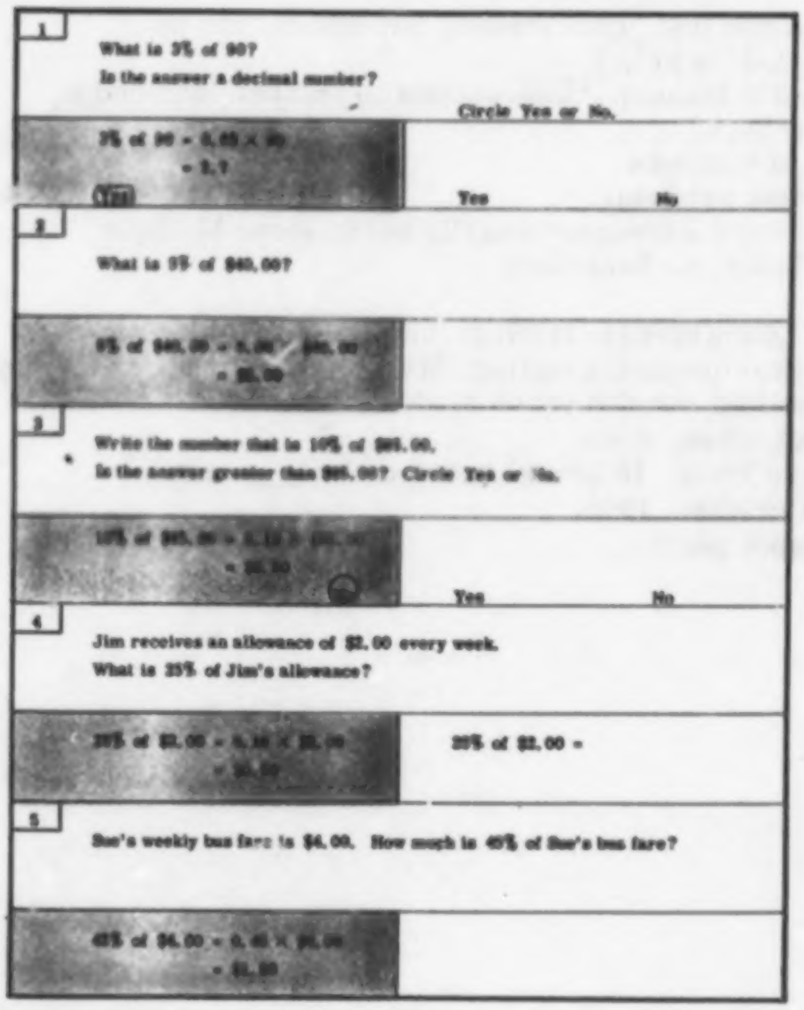
PROBLEMS IN PERCENTAGE
LEWIS J. PEARSALL, Programer, GPTC
AMARYLLIS D. HUNT, Programer, GPTC
JACOB REGER, Editor, GPTC
WAYNE T. ALCOCK, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1200 frames, paperback, 150 pp., 8-1/2" x 11", $____.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: 5th-8th grade students. Field testing: 6th-7th grade students."
Prerequisites: None.
Average Time: 15 hours (based entirely on data).
Next Revision: 1968.
(1 sample page)

ARITHMETIC

PROBLEMS IN PERCENTAGE
Pearsall, Hunt, Reger, Alcock; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



1

What is 3% of 90?
Is the answer a decimal number?

Circle Yes or No.

3% of 90 = 0.03 × 90
= 2.7
[✓ Yes]

Yes No

2

What is 5% of $40.00?

5% of $40.00 = 0.05 × $40.00
= $2.00

3

Write the number that is 10% of $85.00.
Is the answer greater than $85.00? Circle Yes or No.

10% of $85.00 = 0.10 × $85.00
= $8.50

Yes No

4

Jim receives an allowance of $2.00 every week.
What is 25% of Jim's allowance?

25% of $2.00 = 0.25 × $2.00
= $0.50

25% of $2.00 =

5

Sue's weekly bus fare is $4.00. How much is 45% of Sue's bus fare?

45% of $4.00 = 0.45 × $4.00
= $1.80

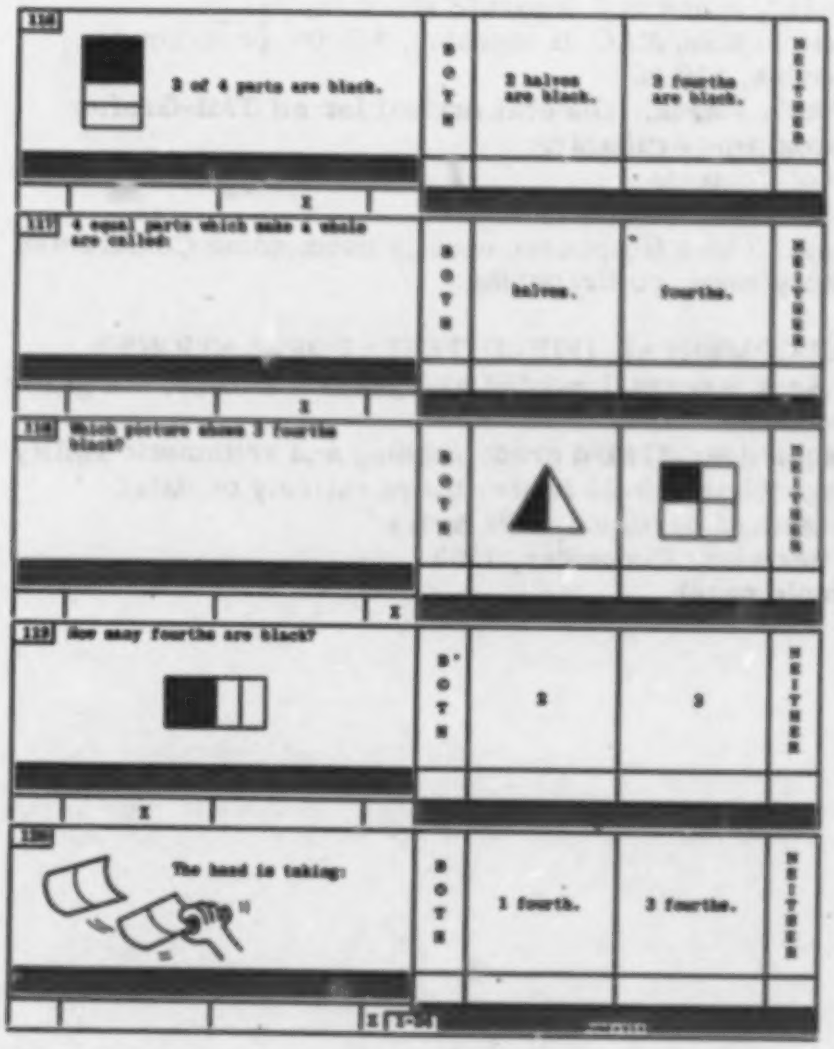
ELEMENTARY ARITHMETIC SERIES: FRACTIONS: BASIC CONCEPTS
GAYLA GLASCOCK
JAMES L. EVANS, both of Teaching Materials Corporation
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York

Programed text, 1,718 frames, paperback, 424 pp., 8-1/2" x 11", bound in 2 separate volumes, $11.00.
For use in MIN/MAC II machine, $25.00; program reusable, $10.00.
Teacher's Manual: General manual for all TMI-Grolier programs available.
Table of Contents.
Unit and Final Test(s) included.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Ages 9 years 3 months to 9 years 7 months, 4th grade students."
Prerequisites: "Third grade reading and arithmetic ability."
Average Time: 15-25 hours (based entirely on data); standard deviation, 2.94 hours.
Next Revision: December, 1963.
(1 sample page)

ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: FRACTIONS: BASIC CONCEPTS
Glascock, Evans; TEACHING MATERIALS CORP.
one sample page:



116 2 of 4 parts are black.
BOTH
2 halves are black.
2 fourths are black.
NEITHER
X

117 4 equal parts which make a whole are called:
BOTH
halves.
fourths.
NEITHER
X

118 Which picture shows 1 fourth black?
BOTH
NEITHER
X

119 How many fourths are black?
BOTH
2
3
NEITHER
X

120 The hand is taking:
BOTH
1 fourth.
2 fourths.
NEITHER
X

ARITHMETIC 6th & 7th grades

FRACTIONS
WILLIAM HAUCK, Mathematics Dept.
J. WILLIAM MOORE, Education Dept.
WENDELL SMITH, Psychology Dept., all of Bucknell University.
Published by McGRAW-HILL BOOK COMPANY, Inc., 330 West 42nd Street, New York City.

Programed text, 1000 frames, $____.
Teacher's Manual available.
Table of Contents.
Constructed Responses always used; some Branching; no Multiple Choice Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental: 10 sixth grade students.
Test: 1 class of sixth grade students; 2 classes of seventh grade students from two junior high schools."
Prerequisites: None
Average Time: 23 hours (est.).
Next Revision: June, 1963.
(1 sample page)

ARITHMETIC

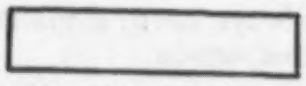
FRACTIONS

Hauck, Moore, Smith; McGRAW-HILL BOOK CO.
one sample page:

(Preliminary Version)

Q1.
In this section you will learn the meaning of the word fraction.

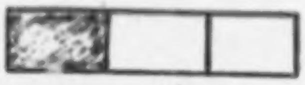
Q2
This is one rectangle:



Here is one rectangle divided into ___?___ equal parts.

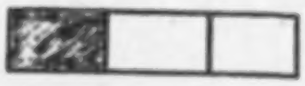
A2 3

Q3
This is the same rectangle all of which is divided into 3 equal parts. How many of the three parts are shaded (1, 2, or 3)?



A3 1

Q4



If you were to write a note to tell how much of the above rectangle is shaded, you could draw the rectangle on the note and write beneath it: "One out of three equal parts of this whole rectangle is shaded."

ARITHMETIC Elem.

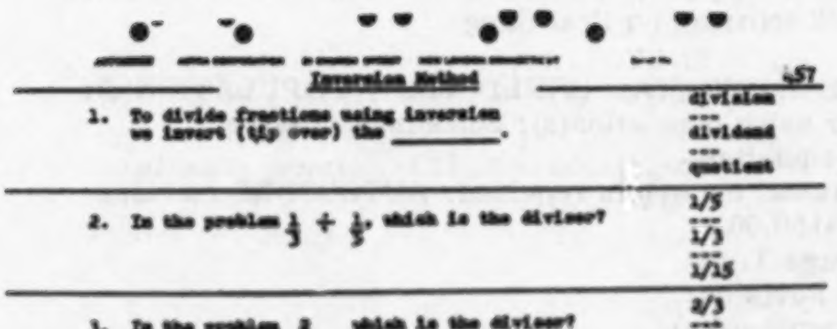
FRACTIONS
ASTRA STAFF
Published by ASTRA
19 Burton Avenue, Norwich, Connecticut

For use in AUTOSCORE machine; program reusable, 700 frames, $15.00.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Other using population(s): Schools of nursing.
Prerequisites:
Additional materials required: AUTOSCORE machine, $150.00.
Average Time:
Next Revision:
(1 sample page)

ARITHMETIC

FRACTIONS
Astra Staff; ASTRA
one sample page:



Inversion Method 457

1. To divide fractions using inversion we invert (tip over) the ________.	division --- dividend --- quotient
2. In the problem $\frac{1}{3} \div \frac{1}{5}$, which is the divisor?	1/5 --- 1/3 --- 1/15
3. In the problem $\frac{\frac{2}{3}}{\frac{1}{2}}$ which is the divisor?	2/3 --- 1/3 --- 1/2
4. $\frac{1}{2}$ inverted becomes ________	2/1 --- 1/2 --- 12
5. $\frac{1}{3} \div \frac{1}{5} =$	1/3 x 5/1 --- 3/1 x 5/1 --- 3/1 x 1/5
6. $\frac{1}{3} \div \frac{1}{5} =$	3/5 --- 15 --- 1 2/3
7. $\frac{3}{8} \div \frac{3}{4} =$	8/3 x 3/4 --- 8/3 x 4/3 --- 3/8 x 4/3
8. $\frac{1}{3} \div \frac{1}{6} =$	2 --- 1/2 --- 3 5/9
9. $\frac{3}{10} \div \frac{5}{6} =$	9/25 --- 1/4 --- 2 7/9
10. $\frac{9}{10} \div \frac{3}{20} =$	6 --- 27/200 --- 1/6

Copyright 1961. ASTRA Corp.

FRACTIONS I & II

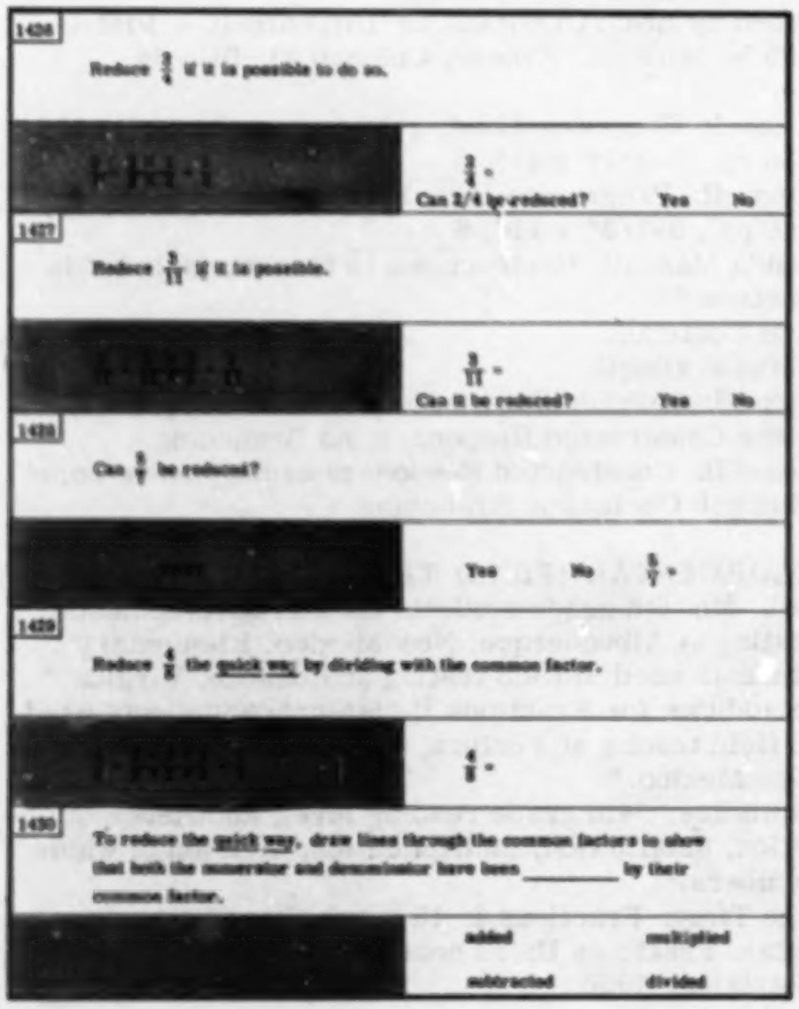
FRANK C. GENTRY, Consultant
JAMES V. DEVINE, Programer, General Programmed Teaching Corporation
LINDA LUE DORAN, Programer, GPTC
AMARYLLIS D. HUNT, Programer, GPTC
WAYNE T. ALCOCK, Editor, GPTC
MARY W. UTTON, Editor, GPTC
JAMES RUDDLE, Editor, GPTC
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Fractions I: Programed text, 1816 frames, paperback, 365 pp., 8-1/2" x 11", $______
Fractions II: Programed text, 1700 frames, paperback, 340 pp., 8-1/2" x 11", $______
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Fractions I: Multiple Choice Responses usually used; some Constructed Responses; no Branching.
Fractions II: Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "4th, 5th, 6th grade students used in developmental testing at Albuquerque, New Mexico; Elementary students used in field testing at Roanoke, Virgina." In addition for Fractions I, "5th grade students used in field testing at Ventura, California and Hobbs, New Mexico."
Prerequisites: "4th grade reading level; knowledge of addition, subtraction, multiplication, division of whole numbers."
Average Time: Fractions I: 15 hours (based entirely on data); Fractions II: 12 hours (based entirely on data).
Next Revision: 1968.
(2 sample pages)

ARITHMETIC

FRACTIONS I & II
Gentry, Devine, Doran, Hunt, Alcock, Utton, Ruddle;
ENCYCLOPAEDIA BRITANNICA PRESS
2 sample pages:



1426

Reduce $\frac{2}{4}$ if it is possible to do so.

$\frac{2}{4}$ =

Can 2/4 be reduced? Yes No

1427

Reduce $\frac{3}{11}$ if it is possible.

$\frac{3}{11}$ =

Can it be reduced? Yes No

1428

Can $\frac{5}{7}$ be reduced?

Yes No $\frac{5}{7}$ =

1429

Reduce $\frac{4}{8}$ the quick way by dividing with the common factor.

$\frac{4}{8}$ =

1430

To reduce the quick way, draw lines through the common factors to show that both the numerator and denominator have been __________ by their common factor.

added multiplied
subtracted divided

431

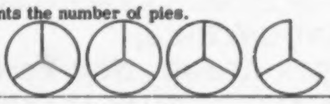
Divide

$\frac{13}{5} = 2\frac{3}{5}$

$\frac{13}{5} =$

432

Circle the mixed number that represents the number of pies.



[✓ $3\frac{2}{3}$]

$3\frac{2}{3}$ $2\frac{3}{2}$

433

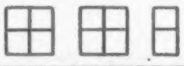
Multiply

$\frac{3}{4} \times \frac{1}{2} \times \frac{2}{1} = \frac{6}{8} = \frac{3}{4}$

$\frac{3}{4} \times \frac{1}{2} \times \frac{2}{1} =$

434

Circle the mixed number that represents the number of blocks.



[✓ $2\frac{1}{2}$]

$2\frac{4}{2}$ $2\frac{1}{4}$ $2\frac{1}{2}$

435

Reduce

$\frac{6}{8} = \frac{3 \times 2 \times 1}{2 \times 2 \times 2} = \frac{3}{4}$

$\frac{6}{8} =$

FRACTIONS
A Basic Course in Arithmetic
BETTY K. FRIEL, U.S.I. Educational Science Division.
Published by DOUBLEDAY & COMPANY, Inc.,
575 Madison Avenue, New York, N.Y.

Programed text, 459 frames, hardcover, 391 pp., 8 1/4" x 5 3/8", $______.
A similar program, FRACTIONS, A Review Course, is available in TM format.
Published by EDUCATIONAL SCIENCE DIVISION,
U.S. INDUSTRIES,
250 Park Avenue, New York, N.Y.
For use in AUTOTUTOR MARK I, $1,250; program reusable, 600 frames, $65.00.
Table of Contents, programed text and machine program; Index, programed text.
Unit and Final Test(s) included.
Multiple Choice Responses and Branching always used; no Constructed Responses.

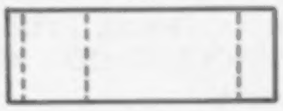
DEVELOPMENTAL (FIELD TEST) POPULATION(S):

Prerequisites:
Additional material required: Pencil and paper.
Average Time: 8-10 hours (est.).
Next Revision: "Not scheduled."
(1 sample page)

ARITHMETIC

FRACTIONS
Friel; DOUBLEDAY & COMPANY
one sample page:

Sample from Fractions



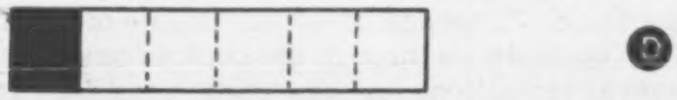
YOUR ANSWER: No, each part is not $\frac{1}{4}$ of the unit.

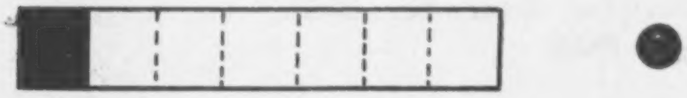
You are correct. In order to use a fraction, we must have equal parts to describe. When there are two equal parts in a unit, each part is called one-half; when there are five equal parts in a unit, each part is called one-fifth; when there are sixteen equal parts in a unit, each one is called one-sixteenth, and so on.

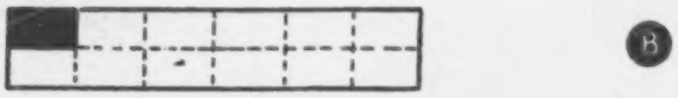
Important Note: Diagrams used on this image and others in this film represent ideas of things; they are not meant to be pictures of things. They are used to help you visualize FRACTIONS. A diagram is a way of showing an idea (abstract) on paper (concrete).

One of these diagrams shows the idea of $\frac{1}{6}$ of a unit.

Choose the diagram in which the shaded part is $\frac{1}{6}$ of the unit.







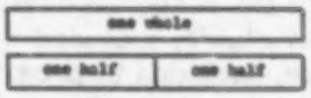
FRACTIONS
A Set of 14 Automated Workbooks
Prepared through the facilities of the DEVEREUX FOUNDATION.
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania.

Programed workbooks, 2016 frames, paperback, 18 pp., each book, 7" x 11". "Available only to special education facilities for exploratory use. For further information contact Dr. Henry Platt, Director of Training, The Devereux Foundation, Devon, Pennsylvania.
For use in DEVEREUX TEACHING AID - MODEL 50, $89.50; program reusable.
Teacher's Manual available, $1.00.
Table of Contents.
Unit test(s) available; coordinated with California Achievement Test, which includes adequate diagnostic profile.
Multiple Choice Responses and Branching usually used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): Both within Devereux and other school systems.
Other using population(s): Experimentally in normal grade schools.
Prerequisites: "Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement—neither is ability to write, so physically handicapped can and do use them."
Additional material required: Devereux Teaching Aid - Model 50, $89.50. Some developmental material available on the Graflex Instructor machine.
Average Time: "Depends on IQ and nature of limitations. Many students go through the book in one hour but require several repetitions on subsequent days."
Next Revision: September, 1963.
(1 sample page)

ARITHMETIC

FRACTIONS
Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:



Set at position g

Look at the chart at the top of the page. The top strip is	Two halves are as long as
one half	one whole
one whole	two wholes
one fourth	four wholes
The second strip is divided into ____ equal parts.	Each part in the bottom strip is
four	one half
six	one third
two	one fourth
The second strip is divided into	How many parts in the bottom strip are shaded?
thirds	two
fourths	three
halves	one
The whole is as long as ____ halves.	In the bottom strip ____ is shaded.
1	
2	2/2
3	1/2

UNDERSTANDING FRACTIONS
THORWALD ESBENSEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)
Published by E-Z SORT SYSTEMS, LTD.,
45 Second Street, San Francisco, California

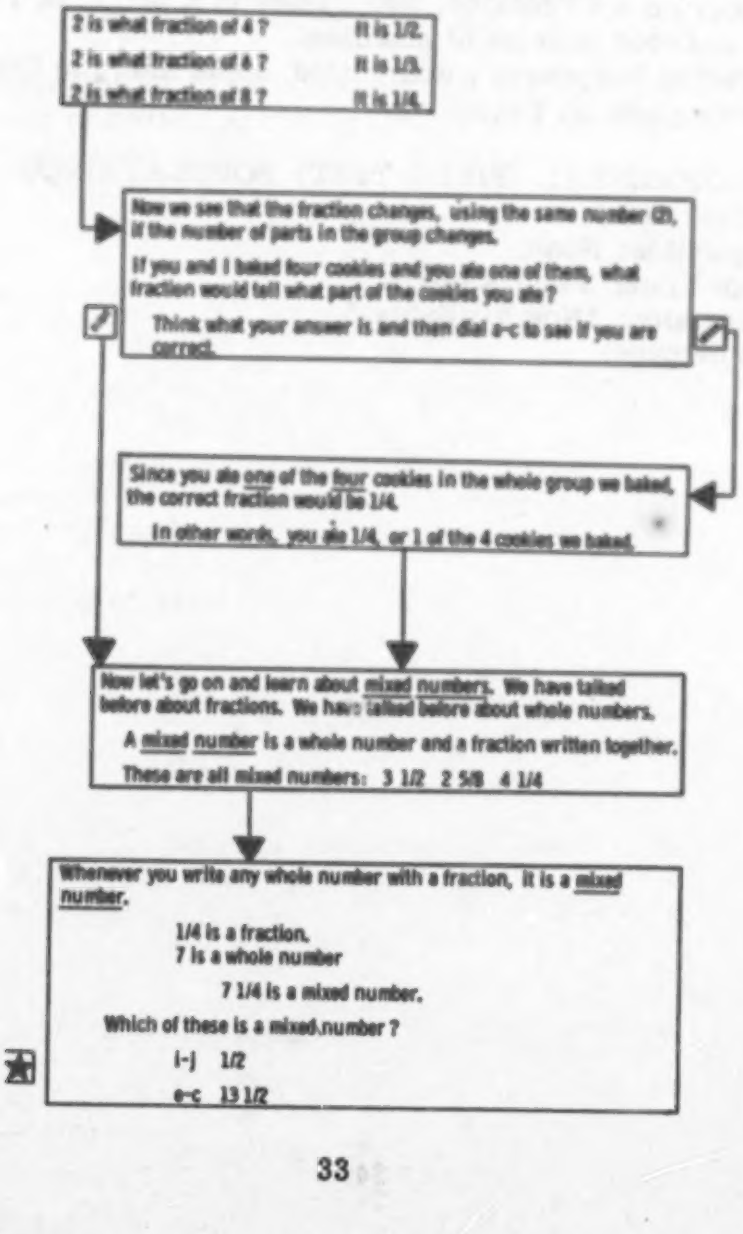
Programed text, 1100 frames, paperback, 200 pp., 5" x 8", $____.
"Program fits response device consisting of 15 edge-punched cards—printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device—a sorter."
Teacher's Manual available, included with program.
Unit test(s) available, included in program.
Multiple Choice Responses usually used; some Constructed Responses; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Elementary."
Prerequisites: "Mastery of addition and subtraction facts. Mastery of easier multiplication and division facts. Mastery of simple computational processes involving whole numbers.
Additional material required: "Response device described above."
Average time: 20 hours (est.).
Next Revision: "Unknown.
(1 sample page)

ARITHMETIC

UNDERSTANDING FRACTIONS
Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS
one sample page:

SAMPLE FRAMES: UNDERSTANDING FRACTIONS



2 is what fraction of 4 ? It is 1/2.
2 is what fraction of 6 ? It is 1/3.
2 is what fraction of 8 ? It is 1/4.

Now we see that the fraction changes, using the same number (2), if the number of parts in the group changes.

If you and I baked four cookies and you ate one of them, what fraction would tell what part of the cookies you ate ?

Think what your answer is and then dial a-c to see if you are correct.

Since you ate one of the four cookies in the whole group we baked, the correct fraction would be 1/4.

In other words, you ate 1/4, or 1 of the 4 cookies we baked.

Now let's go on and learn about mixed numbers. We have talked before about fractions. We have talked before about whole numbers.

A mixed number is a whole number and a fraction written together.

These are all mixed numbers: 3 1/2 2 5/8 4 1/4

Whenever you write any whole number with a fraction, it is a mixed number.

1/4 is a fraction.
7 is a whole number

7 1/4 is a mixed number.

Which of these is a mixed number ?

i-j 1/2
e-c 13 1/2

MISCELLANEOUS ARITHMETIC Elem.

ARITHMETIC I and II
PROFESSOR KRAKOW
MARTIN MEO, New York University
ALEXANDER SCHURE, President, N. Y. Institute of Technology
Published by CENTRAL SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95; program not reusable, 500 frames in I, 500 in II, I or II included in price of machine.

Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Over 200."
Prerequisites: None
Average Time: 3 hours (est.).
Next Revision: "Now available."
(1 sample page)

MISCELLANEOUS ARITHMETIC

ARITHMETIC I and II
Krakow, Meo, Schure; CENTRAL SCIENTIFIC
one sample page:

ARITHMETIC II

31. Let us arrange some fractions in order of sizes. The largest fraction is on the left, and the smallest on the right. Fill in the missing fractions.

1/2, 1/3, 1/5, 1/6 1/8, .

. . . .

1/4, 1/7, 1/9

32. 1/20 is __________ than 1/15.
1/17 is __________ than 1/22.

. . . .

smaller, larger

33. 1/9 is smaller than 1/5 because it has a larger __________.

. . . .

denominator

34. Because 1/4 has a __________ denominator than 1/18, it is the __________ fraction.

. . . .

smaller, larger

MISCELLANEOUS ARITHMETIC

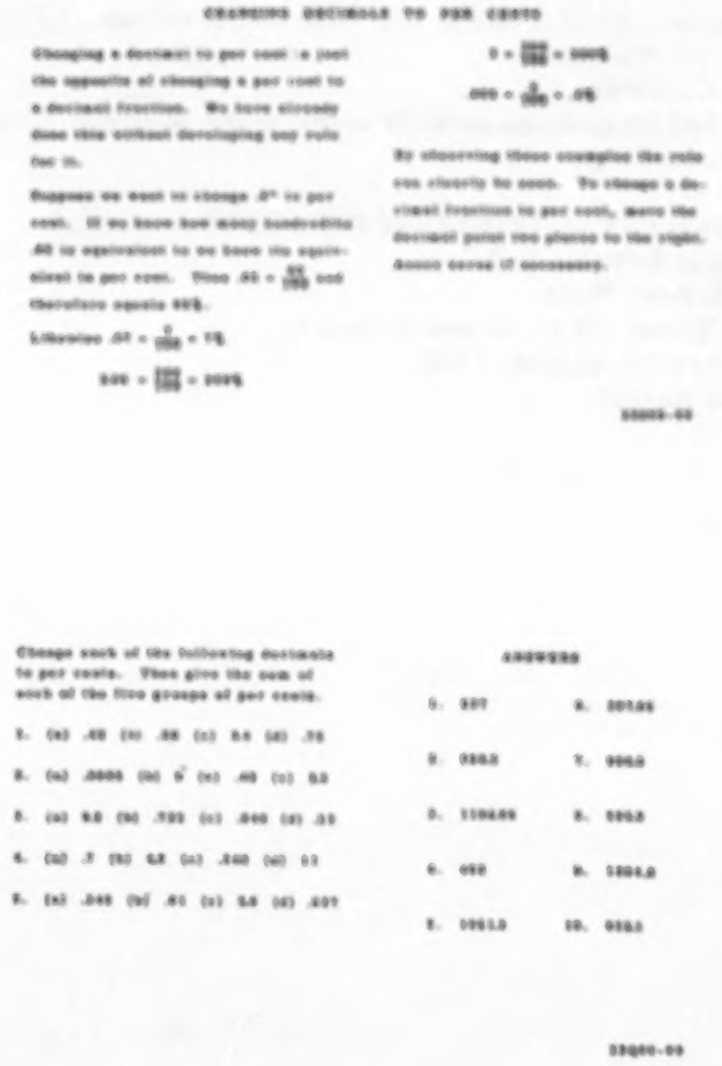
ARITHMETIC 22
R. CLAYTON COURSEY, Education Engineering, Inc.
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 22,780 frames, paperback, 756 pp.,
5" x 7", available in 21 separate units at $3.75 each.
For use in SPEED machine, program reusable, $210.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED machine, $700 &
$850.
Average Time: 50 hours (est.).
Next Revision:
(1 sample page)

MISCELLANEOUS ARITHMETIC

ARITHMETIC 22
Coursey, EDUCATION ENGINEERING
one sample page:



MISCELLANEOUS ARITHMETIC Elem.

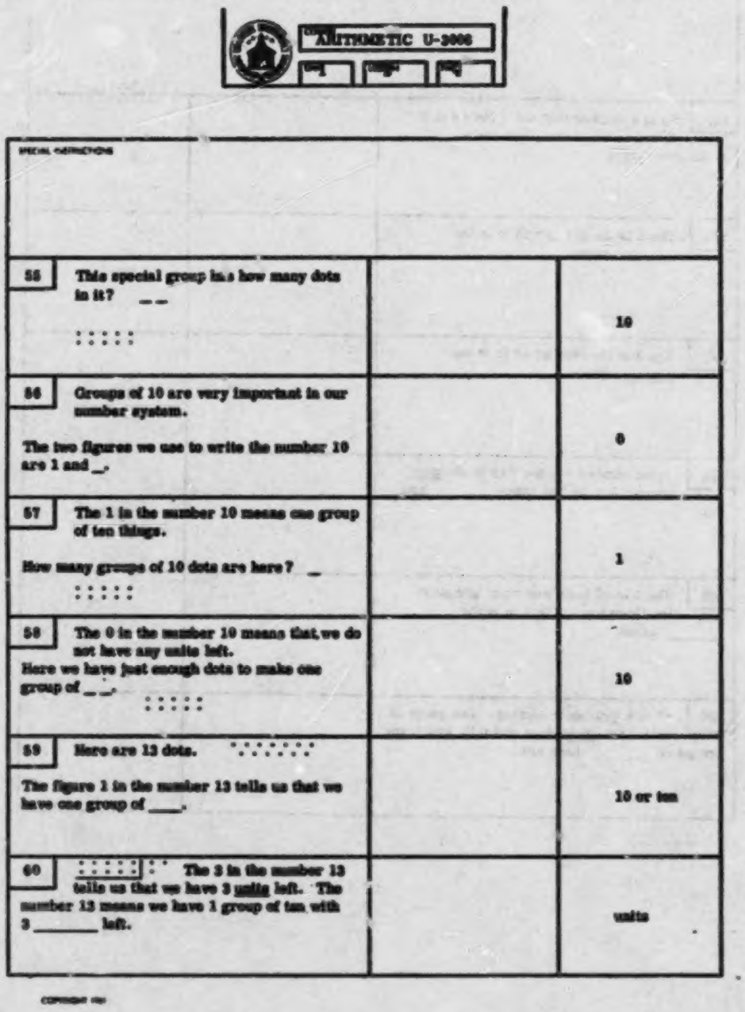
ARITHMETIC U-3008
UNIVERSAL ELECTRONICS LABORATORIES
CORPORATION
Published by UNIVERSAL TEACHING MACHINE
INSTITUTE,
510 Hudson Street, Hackensack, New Jersey.

For use in UNIVERSAL MODEL U machine, program reusable, 2160 frames, machine and program, $25.00 (school discount).
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Grade Level - 2-6."
Prerequisites: None.
Average Time: 28 to 32 hours (est.).
Next Revision: August, 1963.
(2 sample pages)

MISCELLANEOUS ARITHMETIC

ARITHMETIC U-3008
Universal Electronics Laboratories Corporation;
UNIVERSAL TEACHING MACHINE INSTITUTE
2 sample pages:



ARITHMETIC U-3008

SPECIAL INSTRUCTIONS

55 This special group has how many dots in it? _ _ : : : : :		10
56 Groups of 10 are very important in our number system. The two figures we use to write the number 10 are 1 and _.		0
57 The 1 in the number 10 means one group of ten things. How many groups of 10 dots are here? _ : : : : :		1
58 The 0 in the number 10 means that we do not have any units left. Here we have just enough dots to make one group of _ _. : : : : :		10
59 Here are 13 dots. : : : : : : . The figure 1 in the number 13 tells us that we have one group of ____.		10 or ten
60 : : : : : : . The 3 in the number 13 tells us that we have 3 units left. The number 13 means we have 1 group of ten with 3 _______ left.		units

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COURSE ARITHMETIC U-3008

UNIT 1 | LESSON 4 | PAGE 3

SPECIAL INSTRUCTIONS

121 53 is a number that has 2 places in it. There is a 5 in one place and a _______ in the other place.		**3**
122 The 5 in the number 53 is in the _______ place.		**tens'**
123 The 3 in the number 53 is in the _______ place.		**units'**
124 In the number 47, the 7 is in the units' place. It tells how many _______ are left.		**units**
125 The 4 in 47 tells how many groups of ten there are. The 4 is in the _______ place.		**tens'**
126 47 is a two-place number. One place is called the tens' place and tells how many groups of _______ there are.		**ten**

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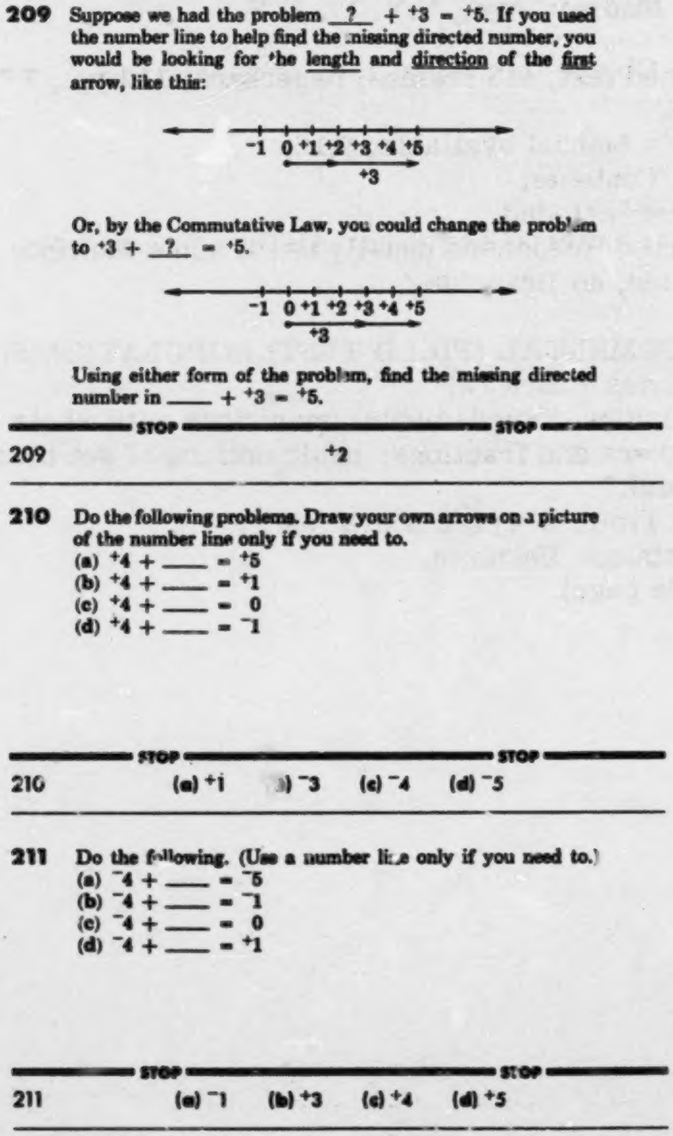
ARITHMETIC OF DIRECTED NUMBERS
EUGENE D. NICHOLS
ROBERT KALIN
HENRY GARLAND, all of Florida State University.
Published by HOLT, RINEHART AND WINSTON,
383 Madison Ave., N.Y. 17, N.Y.

Programed text, 413 frames, paperback, 112 pp., 7" x 10", $.96.
Teacher's Manual available, $.16.
Table of Contents.
Final Test included.
Constructed Responses usually used, some Multiple Choice, no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Grades 7 thru 12."
Prerequisites: "Fundamental operations with whole numbers and fractions; basic notions of set theory helpful."
Average Time: 2-4-1/2 hours (est.).
Next Revision: Unknown.
(1 sample page)

MISCELLANEOUS ARITHMETIC

ARITHMETIC OF DIRECTED NUMBERS
Nichols, Kalin, Garland; HOLT, RINEHART AND WINSTON
one sample page:



209 Suppose we had the problem __?__ + $^{+}3$ = $^{+}5$. If you used the number line to help find the missing directed number, you would be looking for the length and direction of the first arrow, like this:

$^{-}1$ 0 $^{+}1$ $^{+}2$ $^{+}3$ $^{+}4$ $^{+}5$
$^{+}3$

Or, by the Commutative Law, you could change the problem to $^{+}3$ + __?__ = $^{+}5$.

$^{-}1$ 0 $^{+}1$ $^{+}2$ $^{+}3$ $^{+}4$ $^{+}5$
$^{+}3$

Using either form of the problem, find the missing directed number in ____ + $^{+}3$ = $^{+}5$.

STOP STOP

209 $^{+}2$

210 Do the following problems. Draw your own arrows on a picture of the number line only if you need to.

(a) $^{+}4$ + ____ = $^{+}5$
(b) $^{+}4$ + ____ = $^{+}1$
(c) $^{+}4$ + ____ = 0
(d) $^{+}4$ + ____ = $^{-}1$

STOP STOP

210 (a) $^{+}1$ [illegible]) $^{-}3$ (c) $^{-}4$ (d) $^{-}5$

211 Do the following. (Use a number line only if you need to.)

(a) $^{-}4$ + ____ = $^{-}5$
(b) $^{-}4$ + ____ = $^{-}1$
(c) $^{-}4$ + ____ = 0
(d) $^{-}4$ + ____ = $^{+}1$

STOP STOP

211 (a) $^{-}1$ (b) $^{+}3$ (c) $^{+}4$ (d) $^{+}5$

MISCELLANEOUS ARITHMETIC Prim. Elem.

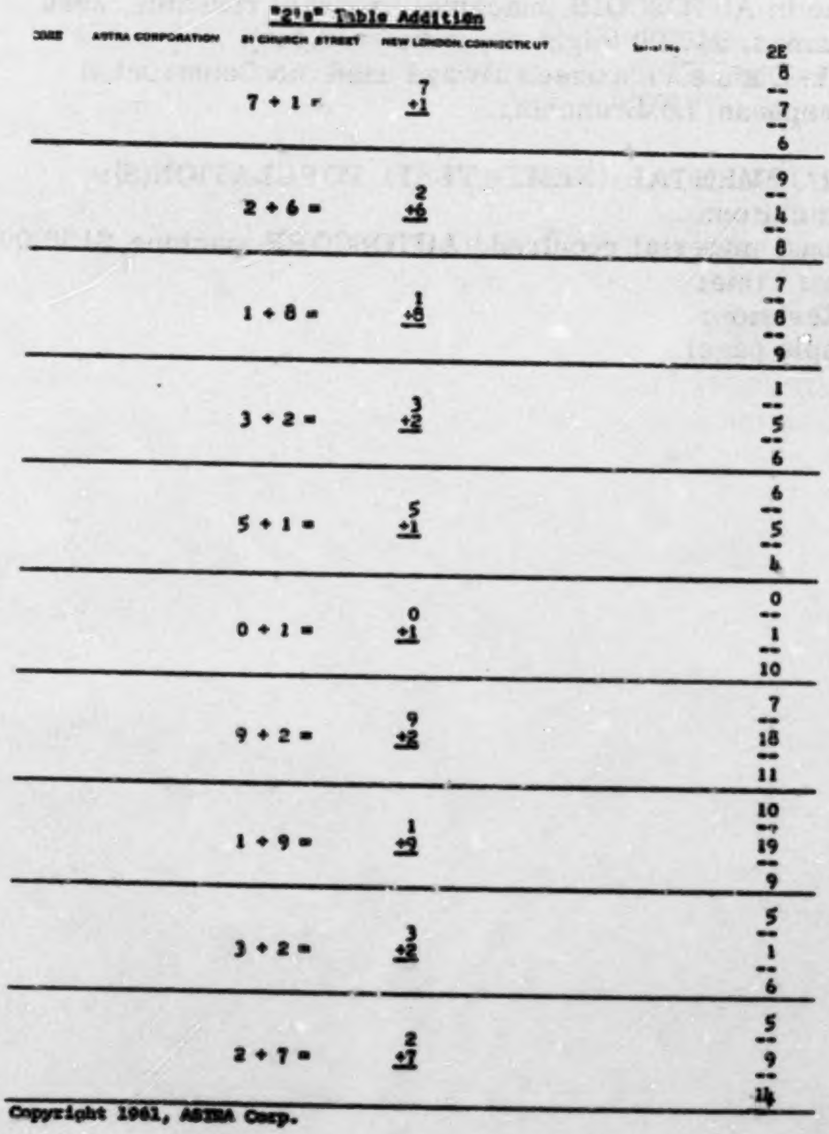
390 ARITHMETIC FACTS
ASTRA STAFF
Published by ASTRA
19 Burton Avenue, Norwich, Connecticut

For use in AUTOSCORE machine; program reusable, 2960 frames, $40.00 (eight separate sections).
Multiple Choice Responses always used; no Constructed Response; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: AUTOSCORE machine, $150.00.
Average Time:
Next Revision:
(1 sample page)

MISCELLANEOUS ARITHMETIC

390 ARITHMETIC FACTS
Astra Staff; ASTRA
one sample page:



"2's" Table Addition

[illegible] ASTRA CORPORATION 21 CHURCH STREET NEW LONDON CONNECTICUT Serial No. 2E

7 + 1 =	$\begin{array}{r}7\\ \underline{+1}\end{array}$	8 -- 7 -- 6
2 + 6 =	$\begin{array}{r}2\\ \underline{+6}\end{array}$	9 -- 4 -- 8
1 + 8 =	$\begin{array}{r}1\\ \underline{+8}\end{array}$	7 -- 8 -- 9
3 + 2 =	$\begin{array}{r}3\\ \underline{+2}\end{array}$	1 -- 5 -- 6
5 + 1 =	$\begin{array}{r}5\\ \underline{+1}\end{array}$	6 -- 5 -- 4
0 + 1 =	$\begin{array}{r}0\\ \underline{+1}\end{array}$	0 -- 1 -- 10
9 + 2 =	$\begin{array}{r}9\\ \underline{+2}\end{array}$	7 -- 18 -- 11
1 + 9 =	$\begin{array}{r}1\\ \underline{+9}\end{array}$	10 -- 19 -- 9
3 + 2 =	$\begin{array}{r}3\\ \underline{+2}\end{array}$	5 -- 1 -- 6
2 + 7 =	$\begin{array}{r}2\\ \underline{+7}\end{array}$	5 -- 9 -- 14

Copyright 1961, ASTRA Corp.

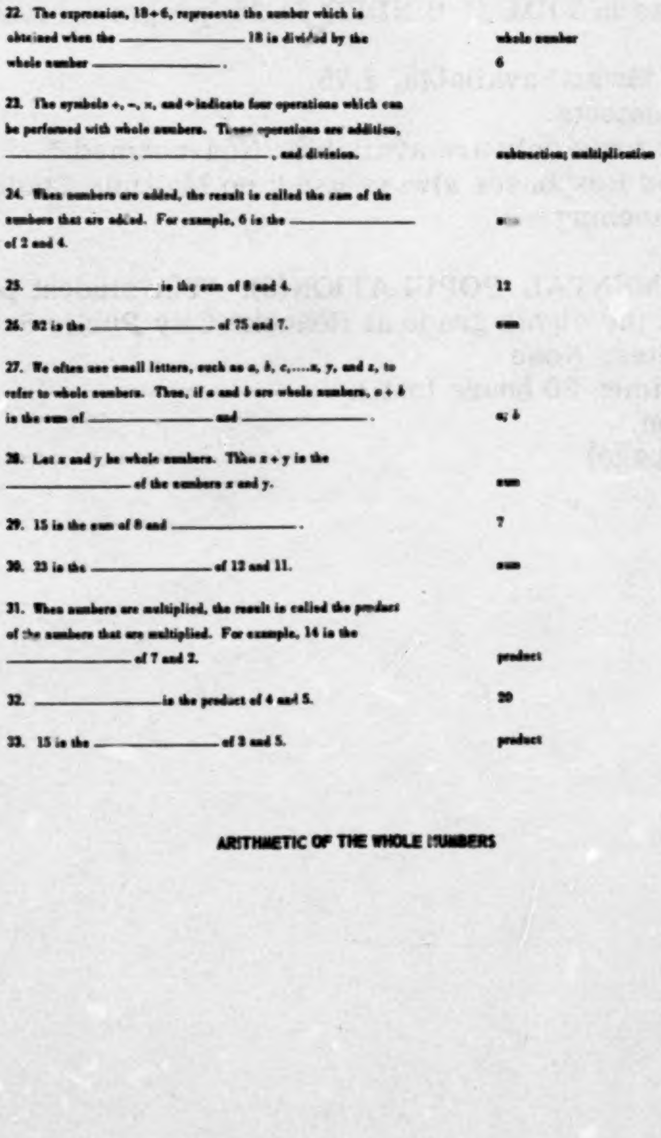
ARITHMETIC OF THE WHOLE NUMBERS
JAMES A. SMITH, Britannica Center for Studies in Learning
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1,582 frames, paperback, 335 pp., 8-1/2" x 11-1/2", $9.75, available in 2 separate units.
For use in TEMAC BINDER $1.25; program reusable, $8.50.
Teacher's Manual available, $.75.
Table of Contents.
"Suggested tests only are available. Non-normed."
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL POPULATION(S): "The student population of the eighth grade at Roanoke City Public Schools."
Prerequisites: None
Average Time: 20 hours (est.).
No Revision.
(1 sample page)

MISCELLANEOUS ARITHMETIC

ARITHMETIC OF THE WHOLE NUMBERS
Smith; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



22. The expression, $18 \div 6$, represents the number which is obtained when the ________ 18 is divided by the whole number ________.	whole number 6
23. The symbols +, −, ×, and ÷ indicate four operations which can be performed with whole numbers. These operations are addition, ________, ________, and division.	subtraction; multiplication
24. When numbers are added, the result is called the *sum* of the numbers that are added. For example, 6 is the ________ of 2 and 4.	sum
25. ________ is the sum of 8 and 4.	12
26. 82 is the ________ of 75 and 7.	sum
27. We often use small letters, such as *a*, *b*, *c*,....*x*, *y*, and *z*, to refer to whole numbers. Thus, if *a* and *b* are whole numbers, $a + b$ is the sum of ________ and ________.	*a*; *b*
28. Let *x* and *y* be whole numbers. Then $x + y$ is the ________ of the numbers *x* and *y*.	sum
29. 15 is the sum of 8 and ________.	7
30. 23 is the ________ of 12 and 11.	sum
31. When numbers are multiplied, the result is called the *product* of the numbers that are multiplied. For example, 14 is the ________ of 7 and 2.	product
32. ________ is the product of 4 and 5.	20
33. 15 is the ________ of 3 and 5.	product

ARITHMETIC OF THE WHOLE NUMBERS

BASES AND NUMERALS
An Introduction to Numeration
VERNON L. DAUSCH, Millburn Junior H. S.
MARTIN M. MOSKOWITZ, Mathematics Department, Vailsburg H. S.
ERNEST R. RANUCCI, Newark State College
MORTON SELTZER, Mathematics Department, Weequahic H.S.
EDWARD J. ZOLL, Newark State College
Published by THE MACMILLAN COMPANY, 60 Fifth Avenue, New York 11, New York
Programed text, 600 frames, paperback, 144 pp., 8-1/4" x 11", $1.50.
For optional use in FLEXITAB BINDER, $1.67 per copy, program can be reusable.
Teacher's Manual in preparation.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Average 7th and 8th grade students. Some testing of students in Grades 5 and 6."
Prerequisites: "Programs will fit in with both "modern" and traditional backgrounds."
Average Time: 15-18 hours (est.)
Next Revision:
(1 sample page)

692-398 O-63—5

MISCELLANEOUS ARITHMETIC

BASES AND NUMERALS

Dausch, Moskowitz, Ranucci, Seltzer, Zoll;
THE MACMILLAN COMPANY
one sample page:

34. In base five $200_{\text{five}} + 30_{\text{five}} = \underline{\qquad\quad}_{\text{five}}$ 230

35. And $320_{\text{five}} + 4_{\text{five}} = \underline{\qquad\quad}_{\text{five}}$ 324

36. Fill in the sums in each of the following.

1. $220_{\text{five}} + 3_{\text{five}} = \underline{\qquad\quad}_{\text{five}}$ 223
2. $40_{\text{six}} + 5_{\text{six}} = \underline{\qquad}_{\text{six}}$ 45
3. $1000_{\text{eight}} + 300_{\text{eight}} + 10_{\text{eight}} = \underline{\qquad\qquad}_{\text{eight}}$ 1310
4. $2000_{\text{nine}} + 100_{\text{nine}} + 30_{\text{nine}} + 6_{\text{nine}} = \underline{\qquad\qquad}_{\text{nine}}$ 2136
5. $1000_{\text{ten}} + 400_{\text{ten}} + 20_{\text{ten}} + 8_{\text{ten}} = \underline{\qquad\qquad}_{\text{ten}}$ 1428

37. In base seven, 41_{seven} means ______ seven(s) and ______ one(s). 4, 1

And 2_{seven} means ______ one(s). 2

38. Then, $41_{\text{seven}} + 2_{\text{seven}}$ means ______ seven(s) and ______ one(s) 4, 1

plus ______ one(s). 2

39. Altogether, then, there are ______ seven(s) and ______ one(s). 4, 3

40. So $41_{\text{seven}} + 2_{\text{seven}} = \underline{\qquad\quad}_{\text{seven}}$ 43

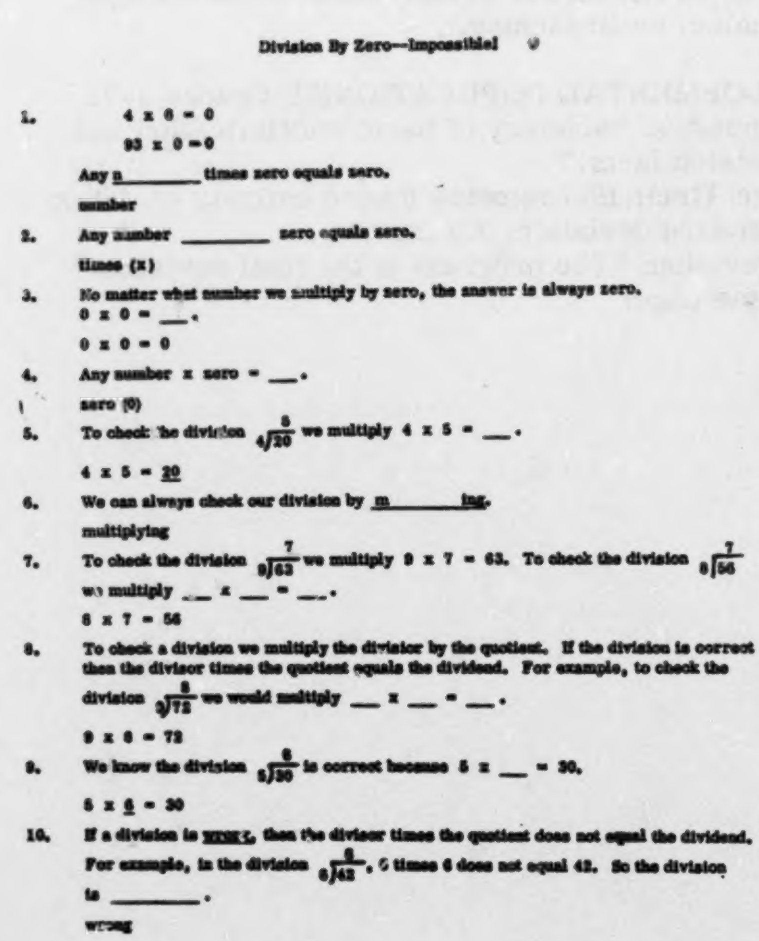
DIVISION BY ZERO--IMPOSSIBLE!
JOAQUIN BUSTOZ, Programer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 32 frames, $.15.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL POPULATION(S): Grades 3-7.
Prerequisites: "Mastery of basic multiplication and division facts."
Average Time: 18.7 minutes (based entirely on data); standard deviation, 3.3 minutes.
Next Revision: "The program is the final revision."
(1 sample page)

MISCELLANEOUS ARITHMETIC

DIVISION BY ZERO—IMPOSSIBLE!
Bustoz; LEARNING INCORPORATED
one sample page:



Division By Zero--Impossible!

1. $4 \times 0 = 0$
   $93 \times 0 = 0$
   Any n________ times zero equals zero.
   number

2. Any number ________ zero equals zero.
   times (x)

3. No matter what number we multiply by zero, the answer is always zero.
   $0 \times 0 =$ ___.
   $0 \times 0 = 0$

4. Any number x zero = ___.
   zero (0)

5. To check the division $\overset{5}{4\overline{)20}}$ we multiply $4 \times 5 =$ ___.
   $4 \times 5 = \underline{20}$

6. We can always check our division by m________ing.
   multiplying

7. To check the division $\overset{7}{9\overline{)63}}$ we multiply $9 \times 7 = 63$. To check the division $\overset{7}{8\overline{)56}}$ we multiply ___ x ___ = ___.
   $8 \times 7 = 56$

8. To check a division we multiply the divisor by the quotient. If the division is correct then the divisor times the quotient equals the dividend. For example, to check the division $\overset{8}{9\overline{)72}}$ we would multiply ___ x ___ = ___.
   $9 \times 8 = 72$

9. We know the division $\overset{6}{5\overline{)30}}$ is correct because 5 x ___ = 30.
   $5 \times \underline{6} = 30$

10. If a division is wrong, then the divisor times the quotient does not equal the dividend. For example, in the division $\overset{6}{6\overline{)42}}$, 6 times 6 does not equal 42. So the division is ________.
    wrong

MISCELLANEOUS ARITHMETIC Prim.

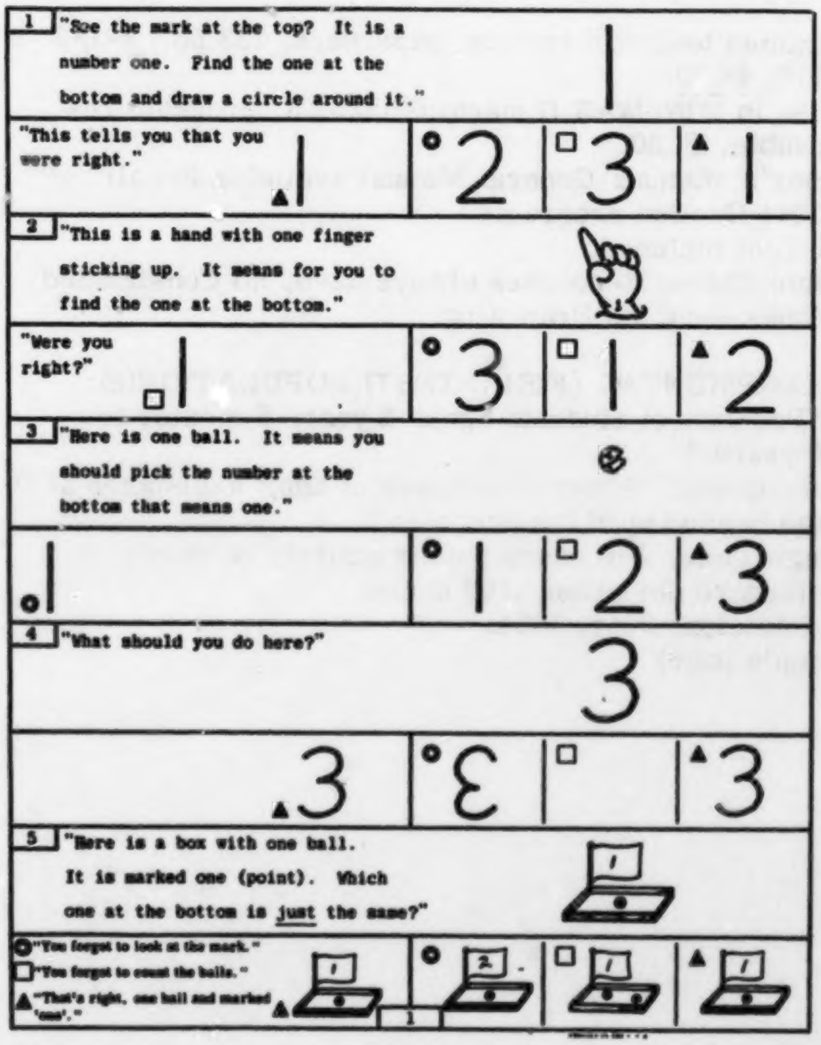
ELEMENTARY ARITHMETIC SERIES: INTRODUCTION TO NUMBERS
LLOYD E. HOMME
DONALD BERTHOLOMEY, Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 615 frames, paperback, 133 pp., 8-1/2" x 11", $8.50.
For use in MIN/MAX II machine, $25.00; program reusable, $7.50.
Teacher's Manual: General Manual available for all TMI-Grolier programs.
Final Test included.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Pre-school students ages: 4 years 6 months to 6 years."
Prerequisites: "About 15 minutes of adult assistance at the beginning of the program."
Average Time: 3-6 hours (based entirely on data); standard deviation, .149 hours.
Next Revision: June, 1964.
(1 sample page)

MISCELLANEOUS ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: INTRODUCTION TO NUMBERS
Homme, Bertholomey; TEACHING MATERIALS CORP.
one sample page:



1 "See the mark at the top? It is a number one. Find the one at the bottom and draw a circle around it."

"This tells you that you were right." ▲1 | ○2 | □3 | ▲1

2 "This is a hand with one finger sticking up. It means for you to find the one at the bottom."

"Were you right?" □1 | ○3 | □1 | ▲2

3 "Here is one ball. It means you should pick the number at the bottom that means one."

○1 | ○1 | □2 | ▲3

4 "What should you do here?"

▲3 | ○Ɛ | □ | ▲3

5 "Here is a box with one ball. It is marked one (point). Which one at the bottom is just the same?"

○"You forgot to look at the mark."
□"You forgot to count the balls."
▲"That's right, one ball and marked 'one'."

1

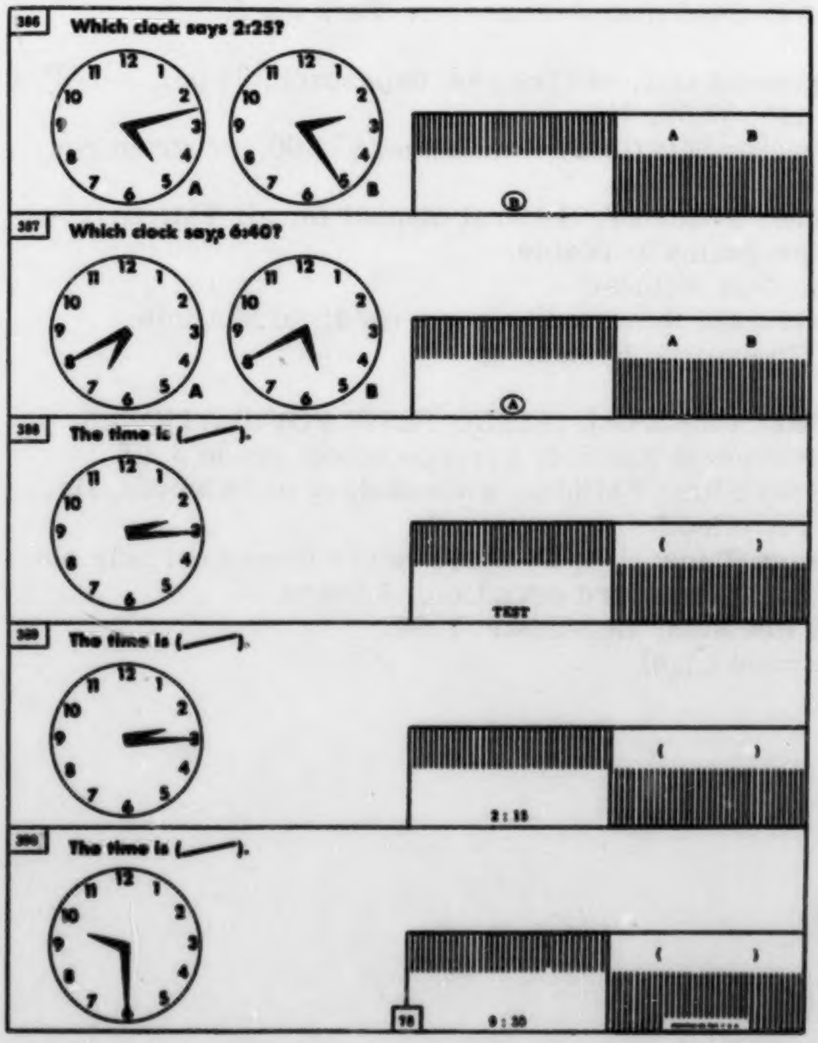
ELEMENTARY ARITHMETIC SERIES: TIME TELLING
DONALD T. TOSTI
POLO C. DE BACA, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 440 frames, paperback, 97 pp., 8-1/2" x 11", $8.50.
For use in MIN/MAX II machine, $25.00; program reusable, $7.50.
Teacher's Manual: General Manual for all TMI-Grolier programs available.
Final Test included.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Average age 8.4; average school grade 3.4."
Prerequisites: "Minimum vocabulary of 46 words, list provided."
Average Time: 1-1/2 - 3-1/2 hours (based entirely on data); standard deviation, 4 hours.
Next Revision: December, 1964.
(1 sample page)

MISCELLANEOUS ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: TIME TELLING
Tosti, De Baca; TEACHING MATERIALS CORPORATION
one sample page:



386 Which clock says 2:25?

A B

Ⓑ

387 Which clock says 6:40?

A B

Ⓐ

388 The time is (_____).

( )

TEST

389 The time is (_____).

( )

2 : 15

390 The time is (_____).

( )

18

9 : 30

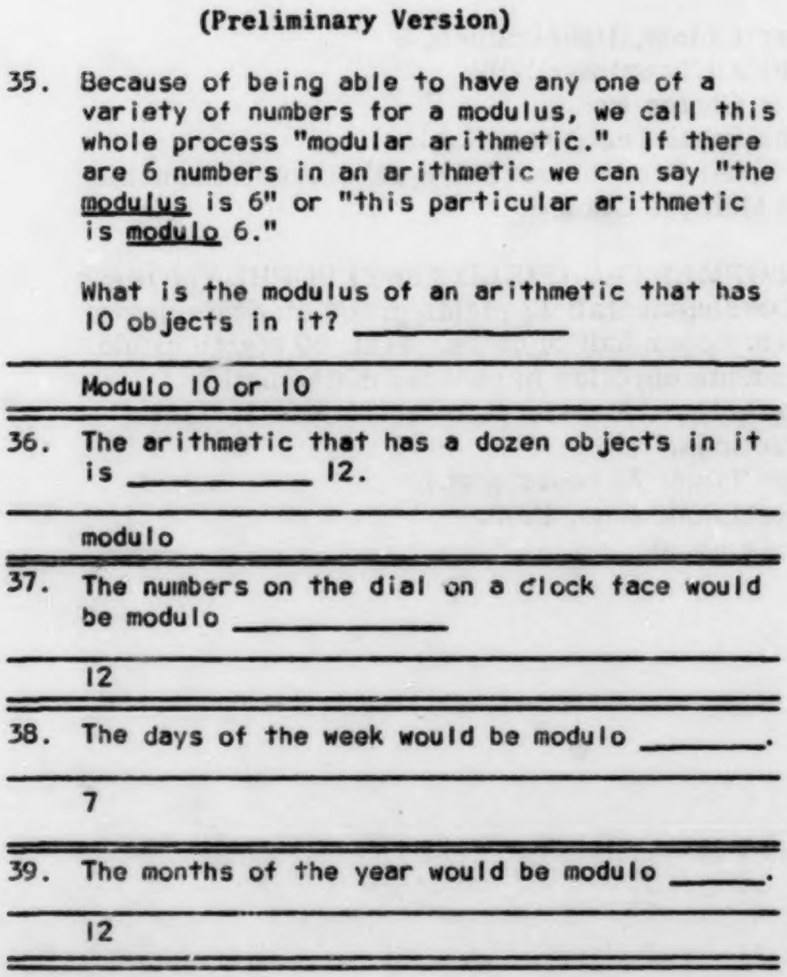
FINITE ARITHMETICS
MILDRED REIGH, Mathematics Dept.
J. WILLIAM MOORE, Education Dept.
WENDELL SMITH, Psychology Dept. all of Bucknell University.
Published by McGRAW-HILL BOOK COMPANY, Inc., 330 West 42nd Street, New York City.

Programed text, 1000 frames, $____.
Teacher's Manual available.
Table of Contents.
Unit and Final Test(s) available.
Constructed Responses always used; some Branching; no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental: 12 eighth grade students drawn from upper half of class. Test: 50 eighth grade students enrolled in general mathematics."
Prerequisites: "Knowledge of arithmetic including fractions."
Average Time: 23 hours (est.).
Next Revision: June, 1963.
(1 sample page)

MISCELLANEOUS ARITHMETIC

FINITE ARITHMETICS
Reigh, Moore, Smith; McGRAW-HILL BOOK COMPANY
one sample page:



(Preliminary Version)

35. Because of being able to have any one of a variety of numbers for a modulus, we call this whole process "modular arithmetic." If there are 6 numbers in an arithmetic we can say "the modulus is 6" or "this particular arithmetic is modulo 6."

What is the modulus of an arithmetic that has 10 objects in it? ________

Modulo 10 or 10

36. The arithmetic that has a dozen objects in it is ________ 12.

modulo

37. The numbers on the dial on a clock face would be modulo ________

12

38. The days of the week would be modulo ______.

7

39. The months of the year would be modulo _____.

12

MISCELLANEOUS ARITHMETIC Elem.+

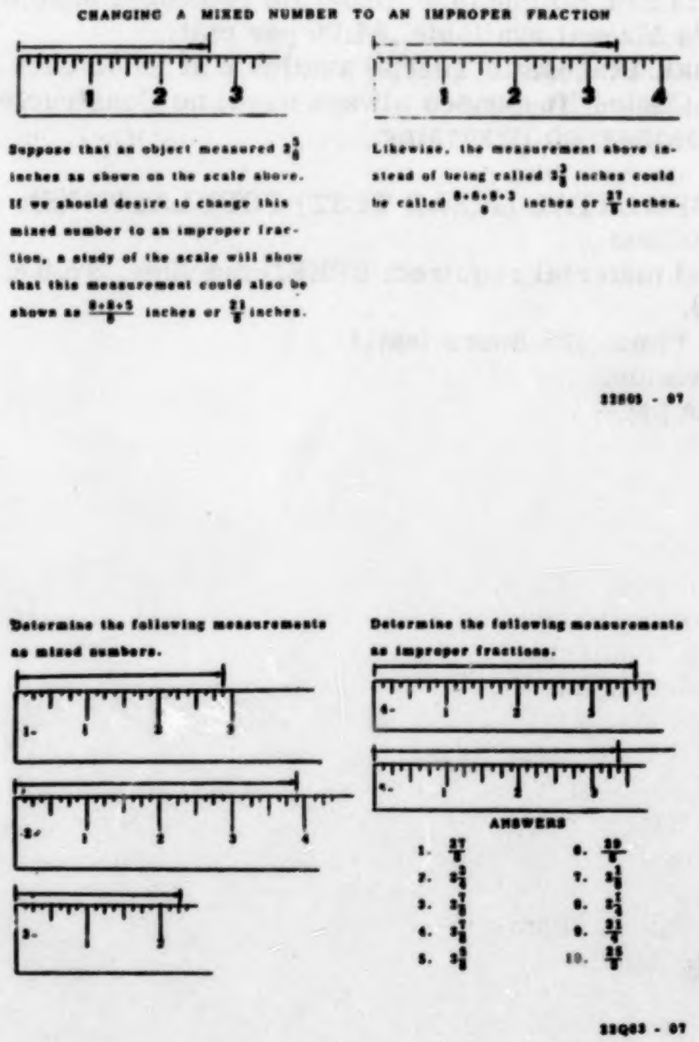
GENERAL MATHEMATICS 40
R. CLAYTON COURSEY, Education Engineering, Inc.
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 57,160 frames, paperback, 1872 pp., 5" x 7", available in 52 separate units at $3.75 each.
For use in SPEED machine, program reusable, $520.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available at $3.75 each.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED machine, $700 & $800.
Average Time: 125 hours (est.).
Next Revision:
(1 sample page)

MISCELLANEOUS ARITHMETIC

GENERAL MATHEMATICS 40
Coursey; EDUCATION ENGINEERING
one sample page:



CHANGING A MIXED NUMBER TO AN IMPROPER FRACTION

Suppose that an object measured $2\frac{5}{8}$ inches as shown on the scale above. If we should desire to change this mixed number to an improper fraction, a study of the scale will show that this measurement could also be shown as $\frac{8+8+5}{8}$ inches or $\frac{21}{8}$ inches.

Likewise, the measurement above instead of being called $3\frac{3}{8}$ inches could be called $\frac{8+8+8+3}{8}$ inches or $\frac{27}{8}$ inches.

22803 - 07

Determine the following measurements as mixed numbers.

Determine the following measurements as improper fractions.

ANSWERS

1. $\frac{27}{8}$
2. $3\frac{3}{4}$
3. $2\frac{7}{8}$
4. $3\frac{7}{8}$
5. $3\frac{5}{8}$
6. $\frac{29}{8}$
7. $3\frac{1}{8}$
8. $2\frac{1}{4}$
9. $\frac{21}{4}$
10. $\frac{25}{8}$

22Q03 - 07

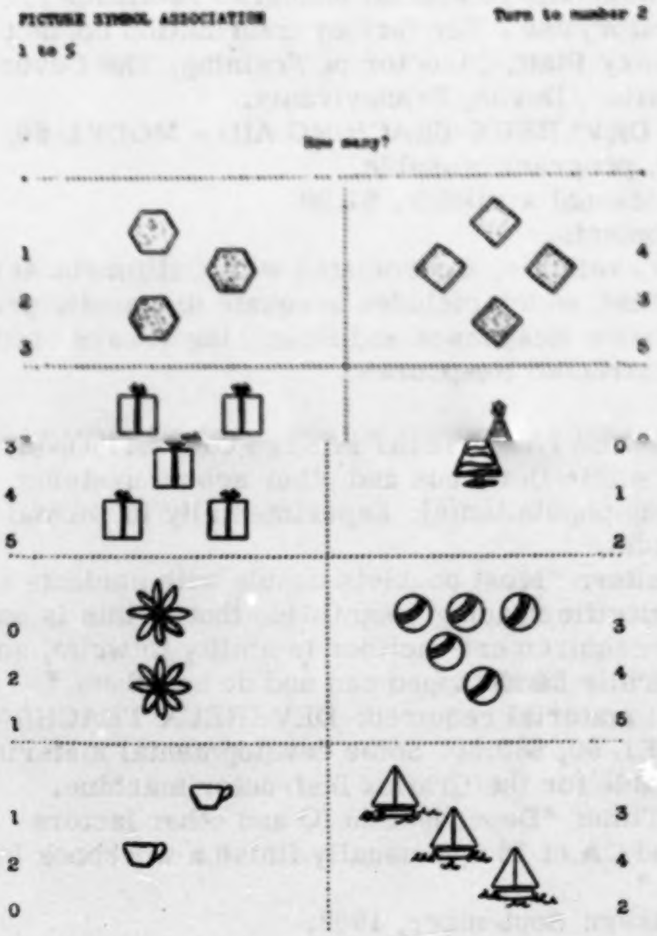
LOWER PRIMARY ARITHMETIC
A Set of 10 Automated Workbooks.
Prepared through the facilities of The Devereux Foundation.
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Penna.

Programed workbooks, 1440 frames, paperback, 7" x 11".
"Available only to special education facilities for exploratory use. For further information contact Dr. Henry Platt, Director of Training, The Devereux Foundation, Devon, Pennsylvania.
For use in DEVEREUX TEACHING AID - MODEL 50, $89.50, program reusable.
Teacher's Manual available, $1.00.
Table of Contents.
Unit test(s) available. Coordinated with California Achievement Test, which includes adequate diagnostic profile.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL *(FIELD TEST) POPULATION(S)*:
Both within Devereux and other school systems.
Other using population(s): Experimentally in normal grade schools.
Prerequisites: "Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement—neither is ability to write, so physically handicapped can and do use them."
Additional material required: DEVEREUX TEACHING AID - MODEL 50, $89.50. Some developmental material available for the Graflex Instructor machine.
Average Time: "Dependent on IQ and other factors; IQ of 70 and CA of 16 will usually finish a workbook in an hour."
Next Revision: September, 1963.
(1 sample page)

MISCELLANEOUS ARITHMETIC

LOWER PRIMARY ARITHMETIC
The Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:



PICTURE SYMBOL ASSOCIATION

1 to 5

Turn to number 2

How many?

1
2
3

4
3
5

3
4
5

0
1
2

0
2
1

3
4
5

1
2
0

3
4
2

MISCELLANEOUS ARITHMETIC Elem.

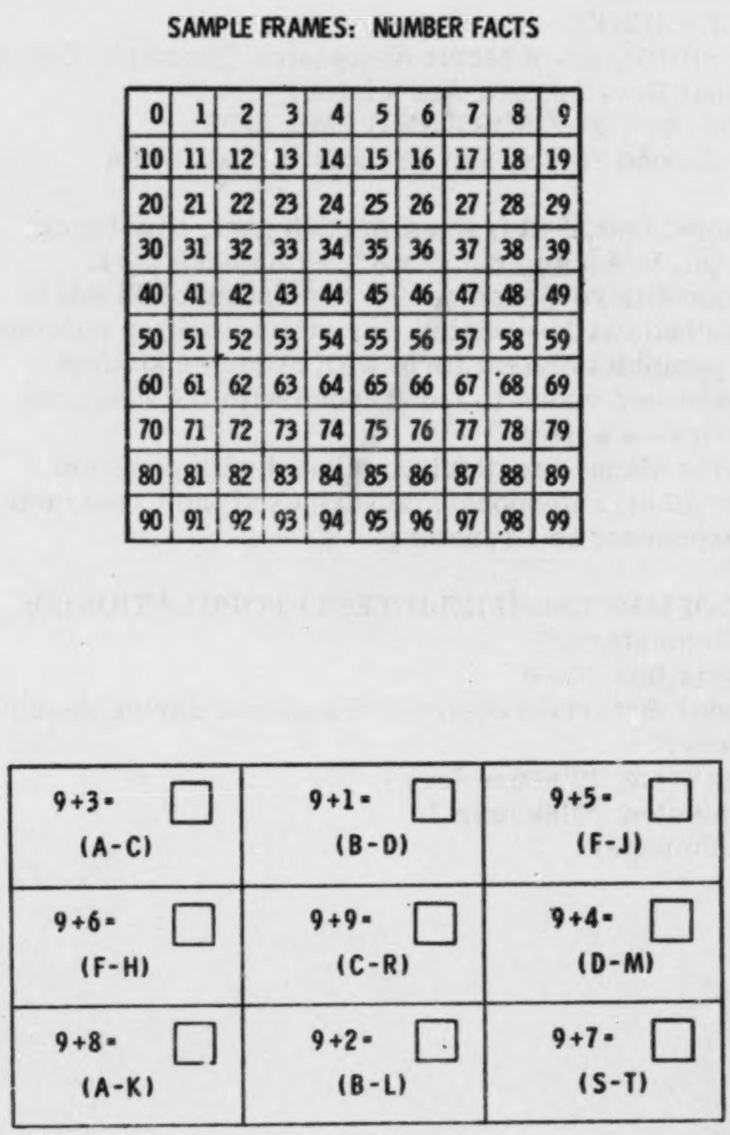
NUMBER FACTS
PART I: Addition & Subtraction; PART II: Multiplication & Division
THORWALD ESBENSEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)
Published by : E-Z SORT SYSTEMS, LTD.,
45 Second Street, San Francisco, California

Programed text, 540 frames in each part, paperback, 75 pp. in each part, 5" x 8", $7.85 each part.
"Program fits response device consisting of 15 edge-punched cards—printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device—a sorter."
Teacher's Manual available, included with program.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Elementary."
Prerequisites: None
Additional material required: "Response device described above."
Average Time: 20 hours (est.).
Next Revision: "Unknown."
(1 sample page)

MISCELLANEOUS ARITHMETIC

NUMBER FACTS
Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS
one sample page:



SAMPLE FRAMES: NUMBER FACTS

0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99

9+3= ☐ (A-C)	9+1= ☐ (B-D)	9+5= ☐ (F-J)
9+6= ☐ (F-H)	9+9= ☐ (C-R)	9+4= ☐ (D-M)
9+8= ☐ (A-K)	9+2= ☐ (B-L)	9+7= ☐ (S-T)

RATIOS & PROPORTIONS
FRANK C. GENTRY, Consultant
EDWARD J. RICKERT, Programer, General Programmed Teaching Corporation
JAMES V. DEVINE, Programer, GPTC
EDNA M. MORGAN, Programer, GPTC
LEWIS PEARSALL, Programer, GPTC
BETTY LOU C. DUBOIS, Editor, GPTC
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

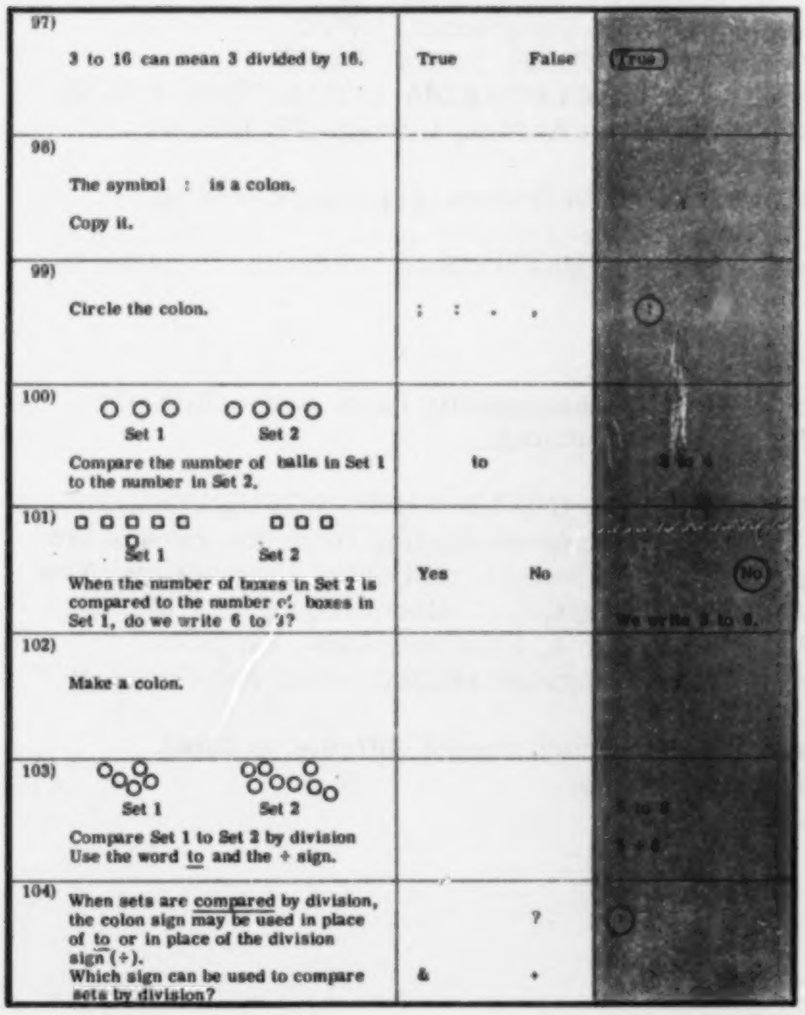
Programed text, 1344 frames, paperback, 268 pp., 8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Elementary students ranging from 5th through 9th grades. Developmental testing in Albuquerque, New Mexico; field testing in Albuquerque, New Mexico; Roanoke, Virginia; Princess Anne, Virginia."
Prerequisites: "5th grade reading level; knowledge of arithmetic."
Average Time: 8 hours (based entirely on data).
Next Revision: 1968.
(1 sample page)

MISCELLANEOUS ARITHMETIC

RATIOS & PROPORTIONS

Gentry, Rickert, Devine, Morgan, Pearsall, Dubois;
ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



97) 3 to 16 can mean 3 divided by 16.	True False	[✓ True]
98) The symbol : is a colon. Copy it.		:
99) Circle the colon.	; : . ,	[✓ :]
100) ○ ○ ○ ○ ○ ○ ○ Set 1 Set 2 Compare the number of balls in Set 1 to the number in Set 2.	to	3 to 4
101) □ □ □ □ □ □ □ □ □ Set 1 Set 2 When the number of boxes in Set 2 is compared to the number of boxes in Set 1, do we write 6 to 3?	Yes No	[✓ No] We write 3 to 6.
102) Make a colon.		:
103) ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ Set 1 Set 2 Compare Set 1 to Set 2 by division Use the word to and the ÷ sign.		5 to 8 5 ÷ 8
104) When sets are compared by division, the colon sign may be used in place of to or in place of the division sign (÷). Which sign can be used to compare sets by division?	? & ÷	[✓ :]

MISCELLANEOUS ARITHMETIC Prim.+

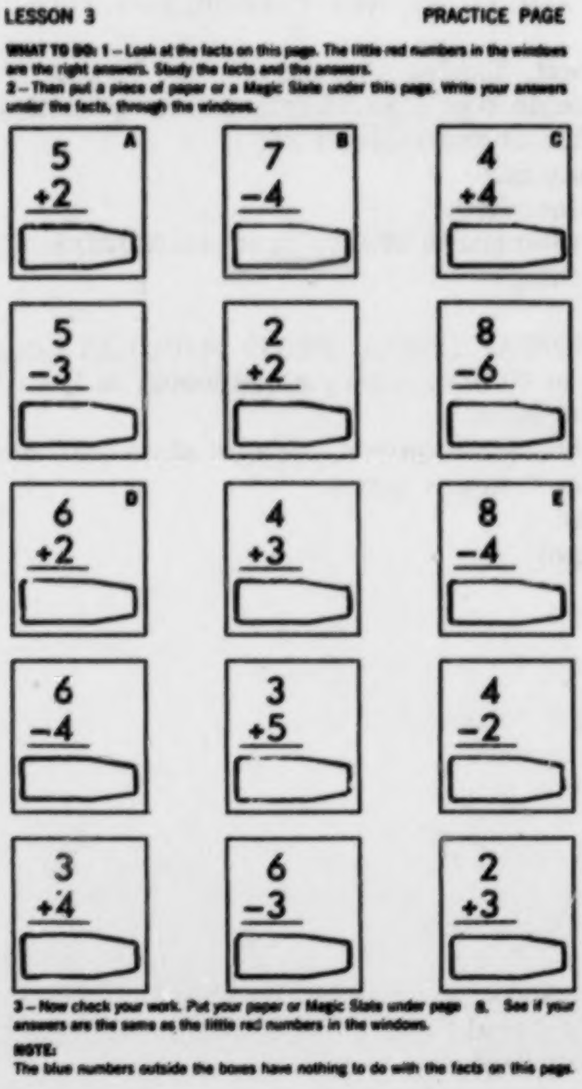
SELF-TEACHING ARITHMETIC BOOKS
Knowledge Master Books
JOHN W. STUDEBAKER
GORDON STUDEBAKER, both of Scholastic Magazines, Inc.
Published by SCHOLASTIC MAGAZINES, Inc.
50 West 44th Street, New York 36, New York.

Programed text, 350 frames, hardcover, 72 pp., 9" x 12",
$4.95 (single copy), $3.95 (classroom quantity).
Teacher's Manual available, $.25.
Table of Contents.
Unit Test(s) included.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Tested in 40 elementary classrooms in Iowa."
Prerequisites: None
Additional material required: "Magic slate" .10 each.
Average Time: 3 hours (est.).
Next Revision:
(1 sample page)

MISCELLANEOUS ARITHMETIC

SELF-TEACHING ARITHMETIC BOOKS
Studebaker, Studebaker; SCHOLASTIC MAGAZINES
one sample page:



LESSON 3 PRACTICE PAGE

WHAT TO DO: 1 – Look at the facts on this page. The little red numbers in the windows are the right answers. Study the facts and the answers.
2 – Then put a piece of paper or a Magic Slate under this page. Write your answers under the facts, through the windows.

5 +2 (A)	7 −4 (B)	4 +4 (C)
5 −3	2 +2	8 −6
6 +2 (D)	4 +3	8 −4 (E)
6 −4	3 +5	4 −2
3 +4	6 −3	2 +3

3 – Now check your work. Put your paper or Magic Slate under page 8. See if your answers are the same as the little red numbers in the windows.

NOTE:
The blue numbers outside the boxes have nothing to do with the facts on this page.

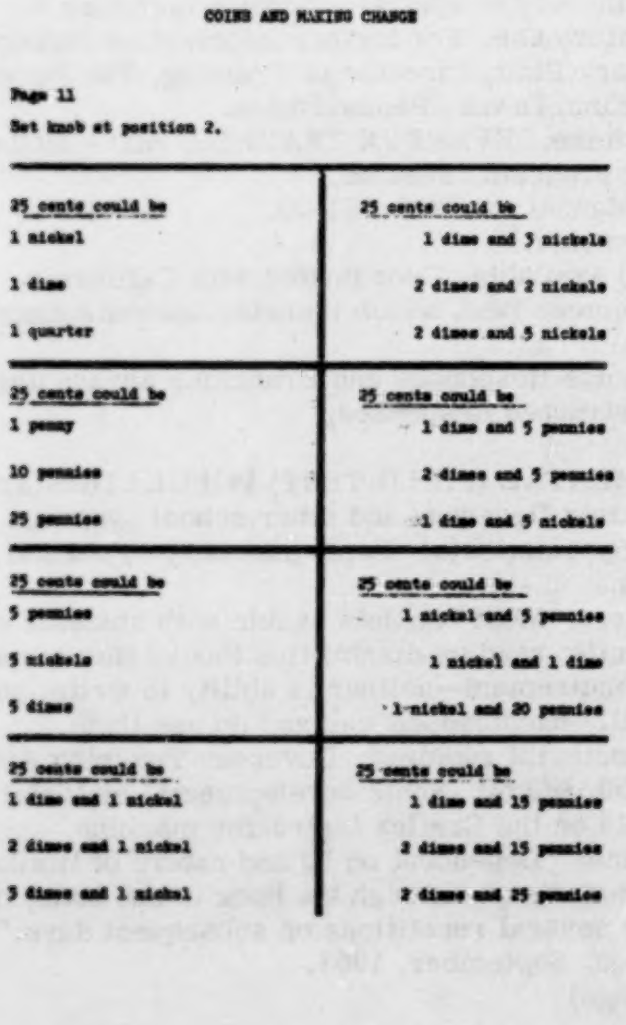
UPPER PRIMARY ARITHMETIC
A Set of 13 Automated Workbooks
Prepared through the facilities of the DEVEREUX FOUNDATION.
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania.

Programed workbooks, 1872 frames, paperback, 7" x 11". Available only to special education facilities for exploratory use. For further information contact Dr. Henry Platt, Director of Training, The Devereux Foundation, Devon, Pennsylvania.
For use with the DEVEREUX TEACHING AID - MODEL 50, $89.50; program reusable.
Teacher's Manual available, $1.00.
Table of Contents.
Unit Test(s) available. Coordinated with California Achievement Test, which includes adequate diagnostic profile.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): Both within Devereux and other school systems.
Other using population(s): Experimentally in normal grade schools.
Prerequisites: "Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement—neither is ability to write, so physically handicapped can and do use them."
Additional material required: Devereux Teaching Aid - Model 50, $89.50. Some developmental material available on the Graflex Instructor machine.
Average Time: "Dependent on IQ and nature of limitations. Many students go through the book in one hour, but require several repetitions on subsequent days."
Next Revision: September, 1963.
(1 sample page)

MISCELLANEOUS ARITHMETIC

UPPER PRIMARY ARITHMETIC
Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:



COINS AND MAKING CHANGE

Page 11

Set knob at position 2.

25 cents could be	25 cents could be
1 nickel	1 dime and 3 nickels
1 dime	2 dimes and 2 nickels
1 quarter	2 dimes and 5 nickels
25 cents could be	25 cents could be
1 penny	1 dime and 5 pennies
10 pennies	2 dimes and 5 pennies
25 pennies	1 dime and 5 nickels
25 cents could be	25 cents could be
5 pennies	1 nickel and 5 pennies
5 nickels	1 nickel and 1 dime
5 dimes	1 nickel and 20 pennies
25 cents could be	25 cents could be
1 dime and 1 nickel	1 dime and 15 pennies
2 dimes and 1 nickel	2 dimes and 15 pennies
3 dimes and 1 nickel	2 dimes and 25 pennies

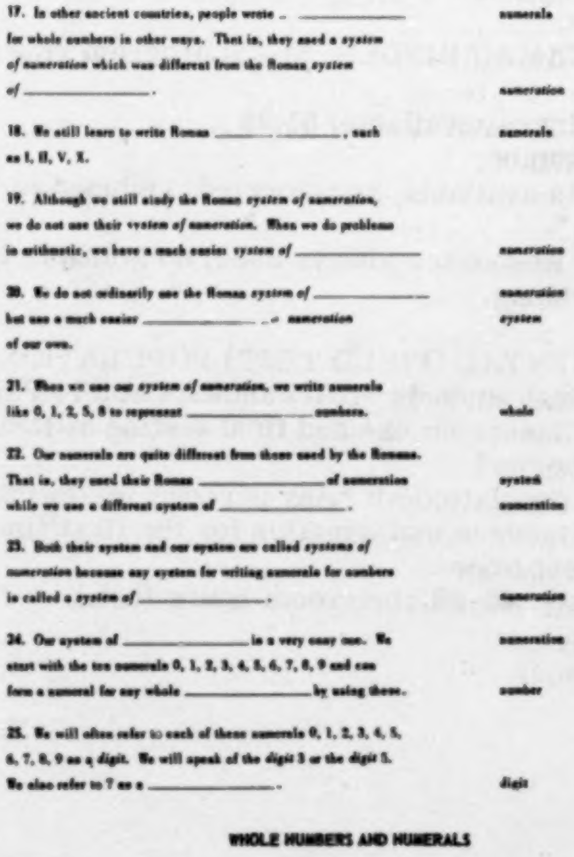
WHOLE NUMBERS AND NUMERALS
JAMES A. SMITH, Britannica Center for Studies in Learning
Published bv: ENCYCLOPAEDIA BRITANNICA PRESS, 425 North Michigan Avenue, Chicago 11, Illinois

Programed text, 2,397 frames, paperback, 370 pp., 8 1/2" x 11 1/2"; $9.75. Bound in 2 separate volumes.
For use in TEMAC BINDER, $1.25; program reusable, $8.50
Teacher's Manual available, $1.25
Table of Contents
"Sample tests available, non-normed, included in Teacher's Manual."
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Individual students at Britannica Center, Palo Alto, Calif. Classroom use and final testing at Roanoke City Schools."
Other using population(s): "Any persons reviewing the field of modern mathematics for the first time."
Prerequisites: None
Average Time: 45-50 classroom hours (est.).
No Revision.
(1 sample page)

MISCELLANEOUS ARITHMETIC

WHOLE NUMBERS AND NUMERALS
Smith; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



17. In other ancient countries, people wrote ______________ numerals
for whole numbers in other ways. That is, they used a *system*
of numeration which was different from the Roman *system*
of ______________. numeration

18. We still learn to write Roman ______________, such numerals
as I, II, V, X.

19. Although we still study the Roman *system of numeration*,
we do not use their *system of numeration*. When we do problems
in arithmetic, we have a much easier *system of* ______________ numeration

20. We do not ordinarily use the Roman *system of* ______________ numeration
but use a much easier ______________ of *numeration* system
of our own.

21. When we use our *system of numeration*, we write numerals
like 0, 1, 2, 5, 8 to represent ______________ numbers. whole

22. Our numerals are quite different from those used by the Romans.
That is, they used their Roman ______________ of numeration system
while we use a different system of ______________. numeration

23. Both their system and our system are called *systems of*
numeration because any system for writing numerals for numbers
is called a *system of* ______________. numeration

24. Our system of ______________ is a very easy one. We numeration
start with the ten numerals 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and can
form a numeral for any whole ______________ by using these. number

25. We will often refer to each of these numerals 0, 1, 2, 3, 4, 5,
6, 7, 8, 9 as a *digit*. We will speak of the *digit* 3 or the *digit* 5.
We also refer to 7 as a ______________. digit

WHOLE NUMBERS AND NUMERALS

ARITHMETIC Prim.+

ELEMENTARY ARITHMETIC SERIES: MULTIPLICATION & DIVISION FACTS (1 through 100)

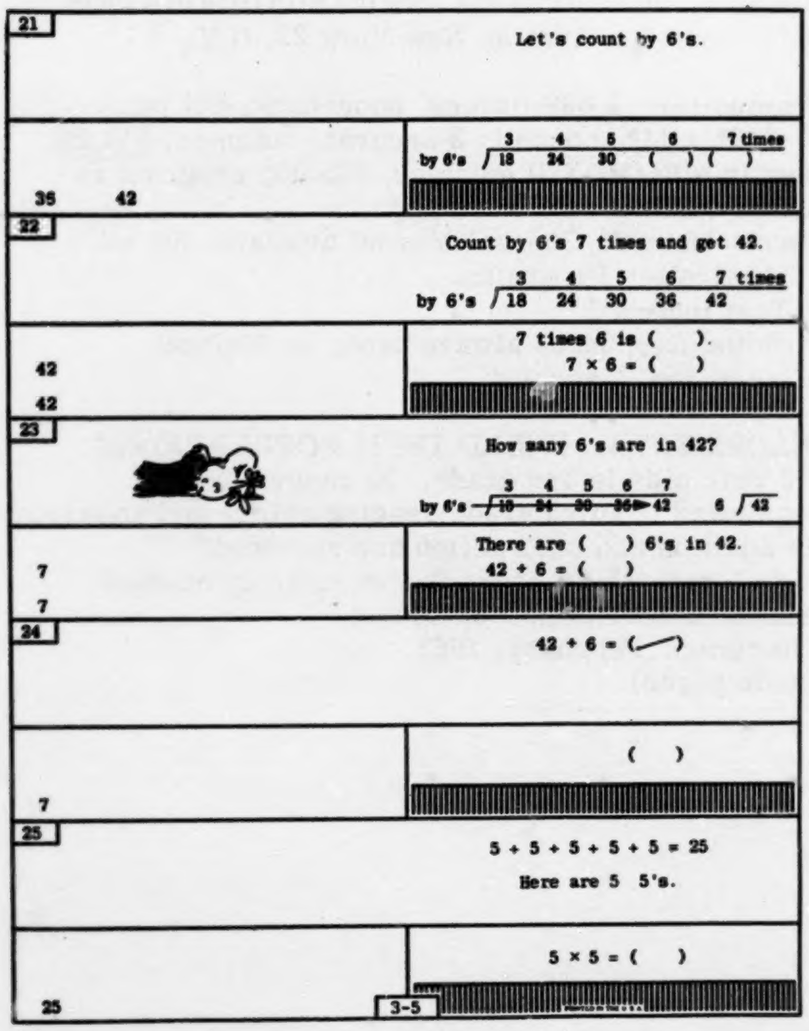
JAMES L. EVANS
DONALD T. TOSTI, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION, 575 Lexington Avenue, New York 22, N.Y.

Programed text, 2,099 frames, paperback, 441 pp., 8-1/2" x 11", bound in 2 separate volumes, $11.00.
For use in MIN/MAX II machine, $25.00; program re-usable, $10.00.
Teacher's Manual: General Manual available for all TMI-Grolier Programs.
Final Test included.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "8 year olds in 3rd grade. IQ range 96-116."
Prerequisites: "Third grade reading ability and knowledge of addition and subtraction are required."
Average Time: 25-30 hours (based entirely on data); standard deviation, 9.62 hours.
Next Revision: February, 1963.
(2 sample pages)

ARITHMETIC

ELEMENTARY ARITHMETIC SERIES: MULTIPLICATION & DIVISION FACTS
Evans, Tosti; TEACHING MATERIALS CORPORATION
2 sample pages:



21

Let's count by 6's.

3 4 5 6 7 times
by 6's / 18 24 30 ( ) ( )

36 42

22

Count by 6's 7 times and get 42.

3 4 5 6 7 times
by 6's / 18 24 30 36 42

7 times 6 is ( ).
7 × 6 = ( )

42
42

23

How many 6's are in 42?

3 4 5 6 7
by 6's / ~~18 24 30 36~~ ▶ 42   6 / 42

There are ( ) 6's in 42.
42 ÷ 6 = ( )

7
7

24

42 ÷ 6 = ( )

( )

7

25

5 + 5 + 5 + 5 + 5 = 25

Here are 5 5's.

5 × 5 = ( )

25

3-5

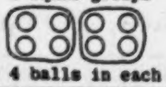
61

3 multiplied by 2 = (____)

6

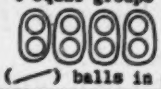
62

2 equal groups



There are 4 balls in each group.

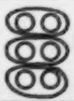
4 equal groups



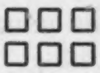
There are (____) balls in each group.

2

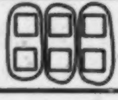
63



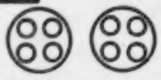
6 balls can be DIVIDED into 3 equal groups.



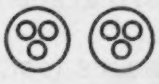
Copy and DIVIDE these into 3 equal groups.



64



8 balls have been divided into 2 equal groups. There are 4 balls in each group.

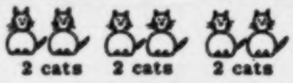


6 balls have been divided into (____) equal groups. How many balls in each group? (____)

2

3

65



6 cats divided into 2's give (____) equal groups of cats.

3

1-13

ARITHMETIC **Elem.**

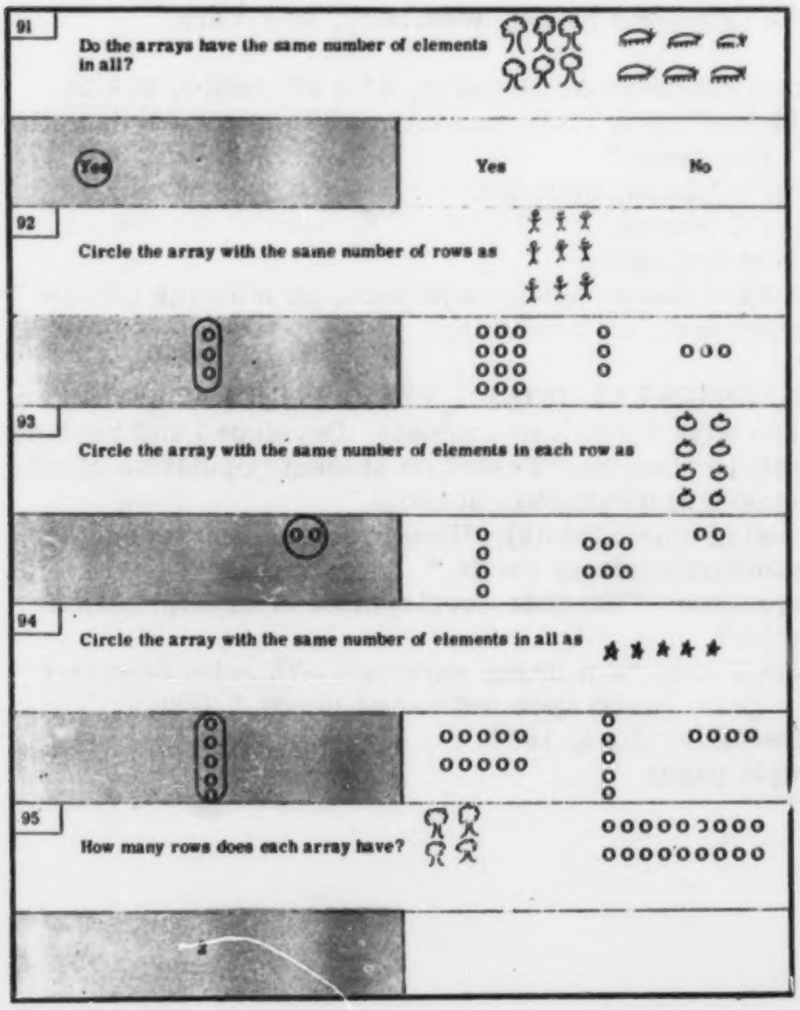
FOUNDATIONS OF MULTIPLICATION & DIVISION
JEROME WHITE, Programer, General Programmed Teaching Corporation
JACOB REGER, Programer, GPTC
SHIRLEY BITTERLICH, Programer, GPTC
BETTY LOU DUBOIS, Editor, GPTC
ARTHUR STEGER, Consultant
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1800 frames, paperback, 360 pp., 8-1/2" x 11", $_______.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental testing: 3rd and 4th grade students. Field testing: 3rd grade students."
Prerequisites: None.
Average Time: 20 hours (est.).
Next Revision: 1968.
(1 sample page)

ARITHMETIC

FOUNDATIONS OF MULTIPLICATION & DIVISION
White, Reger, Bitterlich, Dubois, Steger; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



91 Do the arrays have the same number of elements in all?

Yes

Yes No

92 Circle the array with the same number of rows as

93 Circle the array with the same number of elements in each row as

94 Circle the array with the same number of elements in all as

95 How many rows does each array have?

a

MULTIPLICATION BOX
Developing Automated Response to Multiplication Facts
JEROME BINDER, Reading Consultant and
JOSEPH MILLMAN, Supervisor of Instruction, B-M Educational Productions
Published by B-M EDUCATIONAL PRODUCTIONS,
132 Lexington Street, Westbury, New York

Program available on 50 cards, 5" x 8", boxed, $14.95.
"Multiplication Box consists of 39 plastic cards with 11 pre-tests."
Teacher's Manual included.
Table of Contents.
Final test included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developed with two students. Developed and revised with 10 students. Tested on student population of city schools and suburban schools."
Other using population(s): "Used remediation technique, based on students needs."
Prerequisites: "Teacher development of multiplication facts."
Average Time: "2 minutes each unit—78 units selective program based upon individual needs." (est.).
Next Revision: June, 1963.
(1 sample page)

ARITHMETIC

MULTIPLICATION BOX
Binder, Millman; B-M EDUCATIONAL PRODUCTIONS
one sample page:

DIRECTIONS FOR STUDENTS

Read each part carefully. Fill in all of the blank spaces. After you have filled in the answer, look at the right side of the card. If your answer is not the same as the answer that is given, change your answer and go on to the next part.

1. Place eight dots in each box. The total number of dots are 48 .	1.
2. You could say that .. Six boxes with eight candies in each box are equal to 48 candies.	2.
3. Six boxes with _______candies in each box are equal to 48 candies.	3. eight
4. 48 candies are equal to six boxes with ________ candies in each box.	4. eight
5. etc.	

MULTIPLICATION AND DIVISION
A Set of 9 Automated Workbooks
Prepared through the facilities of THE DEVEREUX FOUNDATION
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania

Programed workbooks, 1296 frames, paperback, 18 pp. each book, 7" x 11". "Available only to special education facilities for exploratory use. For further information contact Dr. Henry Platt, Director of Training, The Devereux Foundation, Devon, Pennsylvania."
For use in DEVEREUX TEACHING AID - MODEL 50 machine, $89.50, program reusable.
Teacher's Manual available, $1.00.
Table of Contents.
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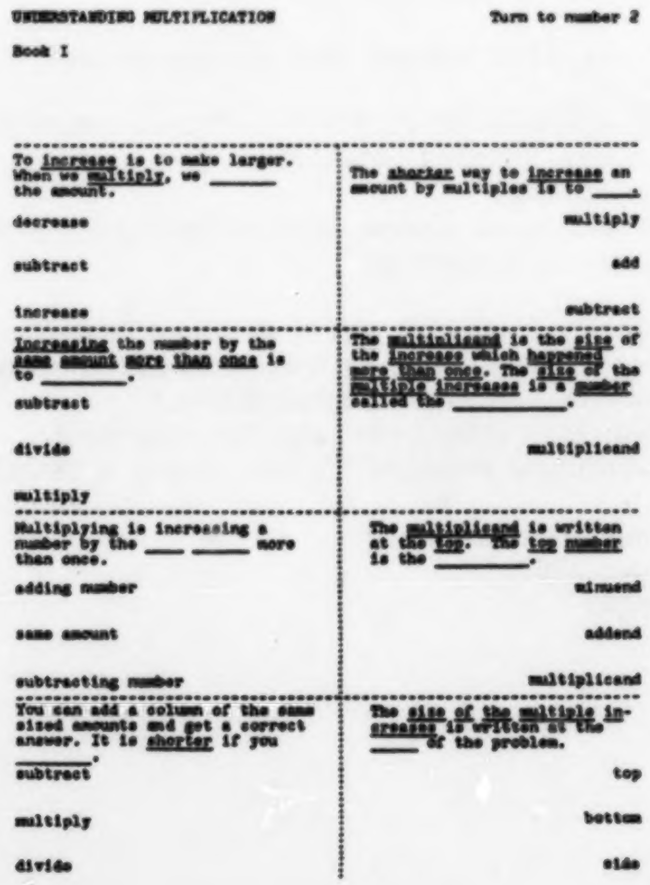
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): Both within Devereux and other school systems.
Other using population(s): Experimentally in normal grade schools.
Prerequisites: "Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement—neither is ability to write, so physically handicapped can and do use them."
Additional material required: Devereux Teaching Aid - Model 50, $89.50. Some developmental material available on the Graflex Instructor machine.
Average Time: "Depends on IQ and nature of limitations. Many students go through the book in one hour but require several repetitions on subsequent days."
Next Revision: September, 1963.
(1 sample page)

ARITHMETIC

MULTIPLICATION AND DIVISION
Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:



UNDERSTANDING MULTIPLICATION Turn to number 2

Book I

To increase is to make larger. When we multiply, we ______ the amount. decrease subtract increase	The shorter way to increase an amount by multiples is to ____. multiply add subtract
Increasing the number by the same amount more than once is to ________. subtract divide multiply	The multiplicand is the size of the increase which happened more than once. The size of the multiple increases is a number called the __________. multiplicand
Multiplying is increasing a number by the ____ _____ more than once. adding number same amount subtracting number	The multiplicand is written at the top. The top number is the _________. minuend addend multiplicand
You can add a column of the same sized amounts and get a correct answer. It is shorter if you ________. subtract multiply divide	The size of the multiple increases is written at the ____ of the problem. top bottom side

BUSINESS EDUCATION & ECONOMICS Adult

THE ACCOUNTING PROCESS
A Programmed Text
GERALD O. WENTHWORTH
A. THOMPSON MONTGOMERY
JAMES A. GOWEN
THOMAS W. HARRELL, all of Stanford School of Business.
Published by: McGRAW-HILL BOOK CO., Inc.,
330 West 42nd Street, New York City.

Programed text, 1205 frames, hard and papercover, 225 pp., 6" x 9", $____.
For use in Koncept-O-Graph, $39.00, program reusable, $9.95.
Table of Contents, Indexed Glossary.
Unit Test(s) included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Original version tested by IBM. Subsequent version in various representative universities."
Prerequisites: High school education or equivalent.
Additional equipment required: Scratch paper & pencil only.
Average Time: 20 hours (est.).
Next Revision: 1965.
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

THE ACCOUNTING PROCESS

Wenthworth, Montgomery, Gowen, Harrell; McGRAW-HILL BOOK CO.

one sample page:

In order to be meaningful, the dollar amounts listed on the Balance Sheet and the Income Statement are classified by accounts. When you refer to these outputs, you will see such classifications as Cash, Inventory, Sales, and Cost of Goods Sold. These classifications are called ________________.	accounts
Cash and Inventory are examples of accounts shown on the Balance Sheet. Sales and Cost of Goods Sold are examples of ________________ shown on the Income Statement.	accounts
The total amount remaining in any account is called the balance. For instance, the dollar amount listed after Cash on the Balance Sheet is the ______________ in the Cash account.	balance
The dollar amounts are listed on the Balance Sheet and the Income Statement according to meaningful classifications called ________________.	accounts
The total amount in any account listed on the Balance Sheet or the Income Statement is called the ________ of that account.	balance
For instance, if you saw on the Balance Sheet the listing "Cash........$2,000," you would know that the ______________ account had a balance of $__________.	Cash $2,000
If you saw the listing "Inventory.........$5,000," you would know that the Inventory ______________ had a ______________ of $5,000.	account balance

BUSINESS EDUCATION & ECONOMICS H.S.-Coll.

PRINCIPLES OF ACCOUNTING
WILLIAM VENTOLO, Associated Programed Learning, Inc.
Published by EDUCATIONAL METHODS, Inc.,
612 North Michigan Avenue, Chicago, Illinois.

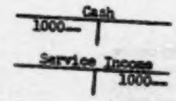
Programed text, 5,000 frames, paperback, 800 pp., 7" x 10", available in about 5 separate volumes, $2.50-$5.00 each; all five volumes $12.00-$25.00.
Table of Contents, Index.
Unit and Final Test(s) available.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: None.
Average Time: 50-60 hours (est.).
Next Revision: September, 1963.
(3 sample pages)

BUSINESS EDUCATION & ECONOMICS

PRINCIPLES OF ACCOUNTING
Ventolo; EDUCATIONAL METHODS
3 sample pages:

debit credit (Either order is correct.)	230. Double-entry bookkeeping requires a ____ and a _____ entry for each transaction.
Yes	231. Must the debit and credit amounts of each transaction be equal?
balance	232. The basic principle of double-entry bookkeeping is the principle of balance. Double-entry means that at least two entries are made in recording each transaction. This system causes one entry to _______ against the other.
income	233. An inflow of assets other than from owners of a business is called income. Thus, a sale of merchandise or services (for cash or on credit) creates ____ for a business.
stockholders' equity	234. Income has the effect of increasing stockholders' equity and could, therefore, be credited to Retained Earnings. Instead, a separate account is provided for each kind of income. Such income accounts are called temporary s_____ e____ accounts.
temporary stockholders' equity	235. Income accounts are called tem____ _________ ______ accounts.
credit	236. Stockholders' Equity Account Increase Income Account Increase An increase in the stockholders' equity is entered on the credit side of the account. Since income has the effect of increasing the stockholders' equity, an increase in an income account is also entered on the ____ side of the account.
increasing	237. Income has the effect of ____(increasing/decreasing) the stockholders' equity.

credit	238. Since income (temporary stockholders' equity) accounts will contain entries that really represent increases in stockholders' equity, an increase in an income account will be entered on the _____ side of the account.
Debit credit	239. Transaction: Cash is received for services rendered to a customer. The debit and credit involved are as follows. _____ Cash; _____ Service Income.
 	240. Transaction: Cash is received for services rendered to a customer, $1000. Prepare simple T-accounts and make the entries. The accounts involved are Cash and Service Income.
expense	241. An outflow of cash, other than to owners of a business, is called an expense. Thus, if salaries are paid to employees, an _____ is insurred by the business.
stockholders' equity	242. Expenses have the effect of reducing stockholders' equity and could, therefore, be debited to Retained Earnings. Instead, a separate account is provided for each kind of expense. Such expense accounts, like income accounts, are called temporary _____ e _____ accounts.
Income expense	243. _____ and _____ accounts are called temporary stockholders' equity accounts.
increasing decreasing	244. Income has the effect of _____ the stockholders' equity, and expenses have the effect of _____ the stockholders' equity.
debit	245. Since an increase in an expense is really a decrease in stockholders' equity, an increase in an expense account is always entered on the _____ side of the account.

246. Transaction: Salaries are paid in cash.

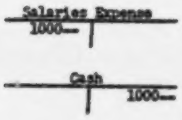
The debit and credit involved are as follows.

_____ Salaries Expense; _____ Cash.

Debit
credit

247. Transaction: Salaries are paid in cash, $1000.

Prepare simple T-accounts and make the entries. The accounts involved are Cash and Salaries Expense.

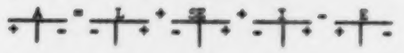


248. Since income accounts have a(n) _____ effect, and expense accounts have a(n) _____ effect on the stockholders' equity, the balance-sheet, Assets = liabilities + stockholders' equity, can be expanded in this manner:

$$A = L + SE + I - E$$

increasing
decreasing

249. If we put the expanded balance-sheet equation in T-account form, showing increases (+) and decreases (-) on the proper debit and credit sides, it would look like this:



By carefully observing this equation, we can see that debit indicates an increase or a decrease in the following accounts.

	Account	Debit
1)	Asset	increase
2)	Liability	?
3)	Stockholders' equity	?
4)	Income	?
5)	Expense	?

2) decrease
3) decrease
4) decrease
5) increase

Bank teller trainees

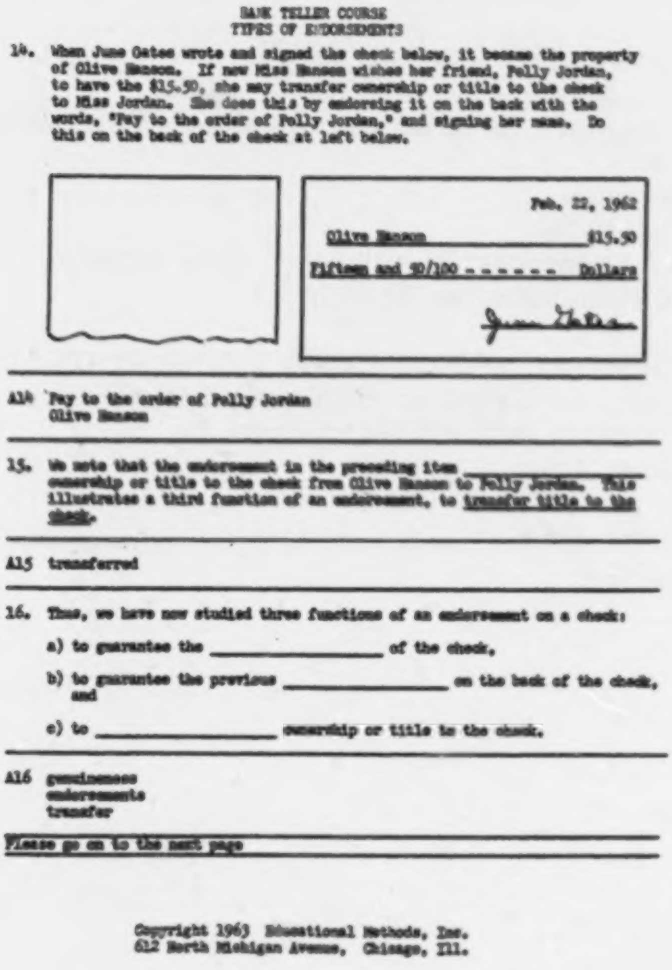
BANK TELLER TRAINING COURSE
RICHARD MORRIS
Published by EDUCATIONAL METHODS, INC.,
612 North Michigan Avenue, Chicago, Illinois.

Programed text, 750 frames, binder, 300 pp., 8 1/2" x 11",
$___, available in 5 separate units.
Separate answer sheets available.
Table of Contents, Index.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"50 bank tellers and trainees in 8 banks across the country."
Prerequisites:
Average time: 6 hours (est.).
Next revision: "April, 1963."
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

BANK TELLER TRAINING COURSE
Morris; EDUCATIONAL METHODS
one sample page:



BANK TELLER COURSE
TYPES OF ENDORSEMENTS

14. When June Gates wrote and signed the check below, it became the property of Olive Hanson. If now Miss Hanson wishes her friend, Polly Jordan, to have the $15.50, she may transfer ownership or title to the check to Miss Jordan. She does this by endorsing it on the back with the words, "Pay to the order of Polly Jordan," and signing her name. Do this on the back of the check at left below.

Feb. 22, 1962
Olive Hanson $15.50
Fifteen and 50/100 - - - - - - Dollars

A14 Pay to the order of Polly Jordan
Olive Hanson

15. We note that the endorsement in the preceding item ______________ ownership or title to the check from Olive Hanson to Polly Jordan. This illustrates a third function of an endorsement, to transfer title to the check.

A15 transferred

16. Thus, we have now studied three functions of an endorsement on a check:

a) to guarantee the ______________ of the check,

b) to guarantee the previous ______________ on the back of the check, and

c) to ______________ ownership or title to the check.

A16 genuineness
endorsements
transfer

Please go on to the next page

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612 North Michigan Avenue, Chicago, Ill.

BUSINESS EDUCATION & ECONOMICS H.S. & Adult Ed.

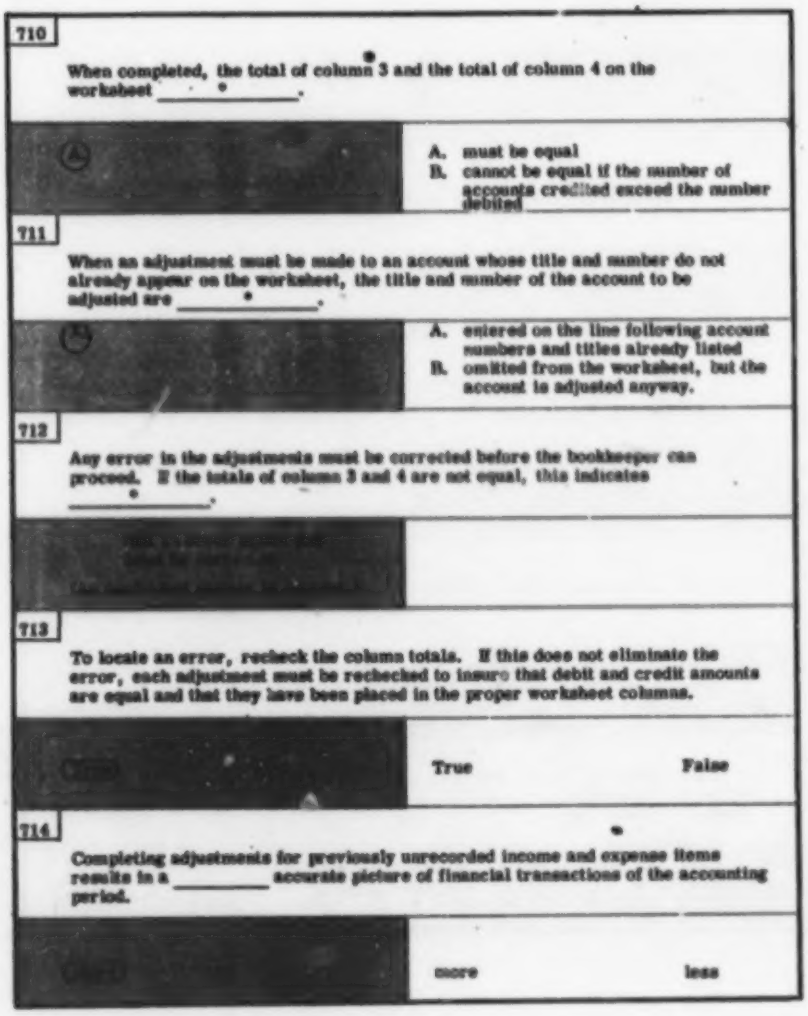
BEGINNING BOOKKEEPING
FREDERICK G. COMSTOCK, Subject Matter Expert
ROBERT M. CHAPLIN, Programer, General Programmed Teaching Corporation
ANNE BEACH, Editor, General Programed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 2010 frames, paperback, 456 pp., 8-1/2" x 11", $ ____.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental testing: High school students.
Field testing: High school students."
Prerequisites: None.
Average Time: 28 hours (est.).
Next Revision: 1968.
(2 sample pages)

BUSINESS EDUCATION & ECONOMICS

BEGINNING BOOKKEEPING
Comstock, Chaplin, Beach; ENCYCLOPAEDIA BRITANNICA PRESS
2 sample pages:



710

When completed, the total of column 3 and the total of column 4 on the worksheet ______________.

A. must be equal
B. cannot be equal if the number of accounts credited exceed the number debited

711

When an adjustment must be made to an account whose title and number do not already appear on the worksheet, the title and number of the account to be adjusted are ______________.

A. entered on the line following account numbers and titles already listed
B. omitted from the worksheet, but the account is adjusted anyway.

712

Any error in the adjustments must be corrected before the bookkeeper can proceed. If the totals of column 3 and 4 are not equal, this indicates ______________.

713

To locate an error, recheck the column totals. If this does not eliminate the error, each adjustment must be rechecked to insure that debit and credit amounts are equal and that they have been placed in the proper worksheet columns.

True False

714

Completing adjustments for previously unrecorded income and expense items results in a __________ accurate picture of financial transactions of the accounting period.

more less

715

What is the heading of columns 5 and 6 on the worksheet illustrated in *Figure 25*?

(5)	(6)
Adjusted Trial Balance	
Dr.	Cr.

(5)	(6)

716

Worksheet columns 5 and 6 consist of an adjusted ______ ________

trial balance

717

To complete the adjusted trial balance, the bookkeeper combines the amounts entered on the same lines in columns 1, 2, 3, and 4 and extends them to columns 5 and 6, the Adjusted ______ ________ columns.

Trial Balance

718

Amounts in the Adjusted Trial Balance columns represent balances in the accounts _____ the adjustments for accrued and deferred items have been made.

after

before after

719

If an account having a debit balance in column 1 on the worksheet is adjusted with a debit in column 3, the amounts are _________ when the balance is extended to column 5.

added subtracted

BUSINESS EDUCATION & ECONOMICS H.S.-Coll.+

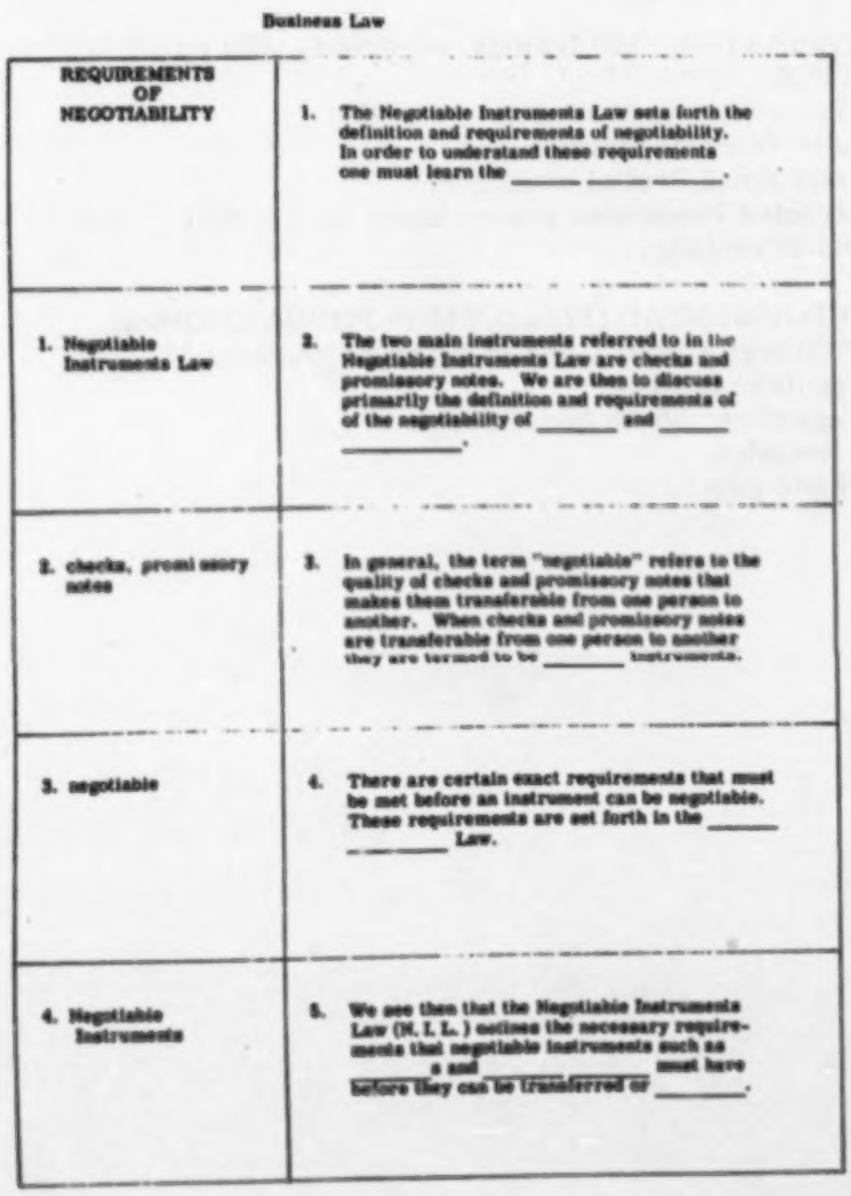
BUSINESS LAW
JOHN R. FONSECA, Director of Educational Programs,
Hamilton Research Associates.
Published by HAMILTON RESEARCH ASSOCIATES, Inc.,
Seneca Turnpike, New Hartford, N. Y.

Programed text, 6500 frames, paperback, 800 pp., 8 1/2" x 11",$____.
Teacher's Manual available.
Table of Contents, Index.
Unit and Final Test(s) available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"College students and high school students."
Prerequisites: None.
Average time: 60-75 hours (est.).
Next Revision:
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

BUSINESS LAW
Fonseca; HAMILTON RESEARCH ASSOCIATES
one sample page:



Business Law

REQUIREMENTS OF NEGOTIABILITY	**1. The Negotiable Instruments Law sets forth the definition and requirements of negotiability. In order to understand these requirements one must learn the ______ ______ ______.**
1. Negotiable Instruments Law	**2. The two main instruments referred to in the Negotiable Instruments Law are checks and promissory notes. We are then to discuss primarily the definition and requirements of of the negotiability of ______ and ______ ______.**
2. checks, promissory notes	**3. In general, the term "negotiable" refers to the quality of checks and promissory notes that makes them transferable from one person to another. When checks and promissory notes are transferable from one person to another they are termed to be ______ instruments.**
3. negotiable	**4. There are certain exact requirements that must be met before an instrument can be negotiable. These requirements are set forth in the ______ ______ Law.**
4. Negotiable Instruments	**5. We see then that the Negotiable Instruments Law (N. I. L.) outlines the necessary requirements that negotiable instruments such as ______s and ______ must have before they can be transferred or ______.**

BUSINESS EDUCATION & ECONOMICS Coll.

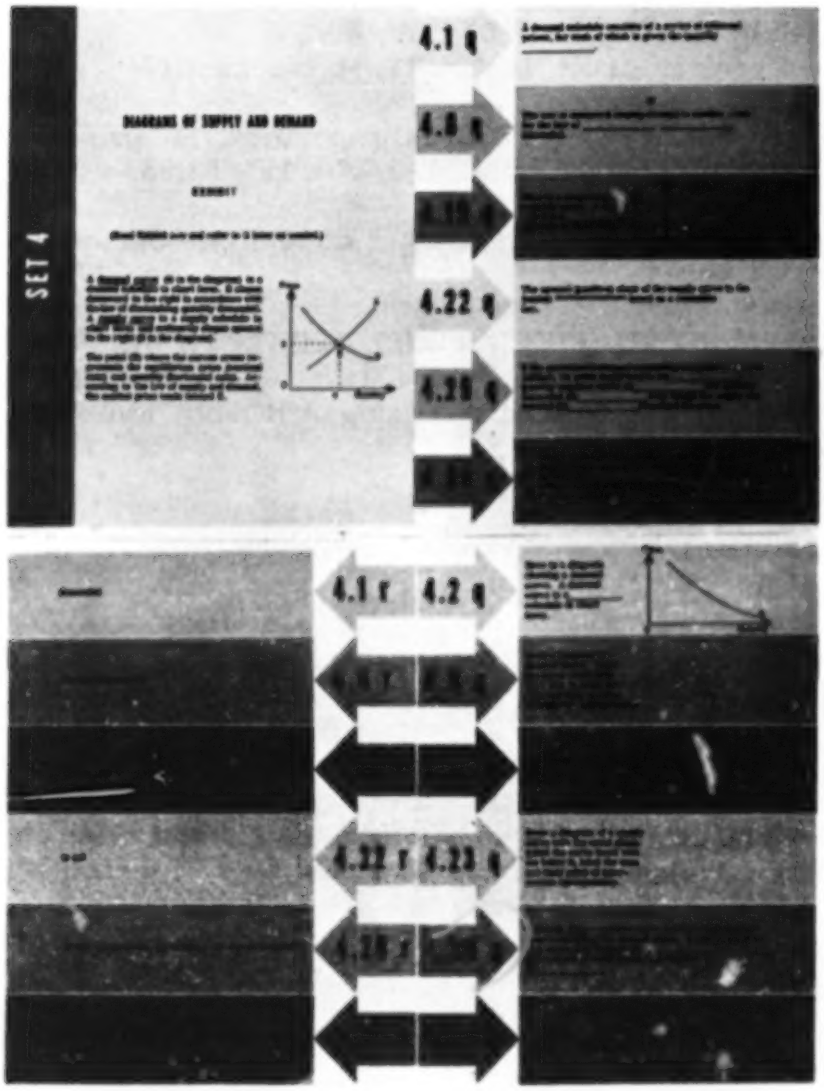
Part I, Student Workbook to Accompany CHALLENGE TO THE AMERICAN ECONOMY
RENDIGS FELS, Department of Economics, Vanderbilt University
DENNIS STARLEAF, Instructor, Vanderbilt University
MARJORIE CHURCHILL
Published by ALLYN AND BACON, Inc.,
150 Tremont Street, Boston 11, Massachusetts

Programed workbook, 299 frames, paperback, 116 programed pp. (286 pp. total), 8-1/2" x 11", $3.95.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Tested on approximately 200 students at Vanderbilt University under the directorship of Rendigs Fels."
Prerequisites: None.
Average Time: 4 hours (est.).
Next Revision: "Unknown."
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

CHALLENGE TO THE AMERICAN ECONOMY
Fels, Starleaf, Churchill; ALLYN AND BACON
one sample page:


SET 4
DIAGRAMS OF SUPPLY AND DEMAND
4.1 q
4.22 q
4.1 r
4.2 q
4.22 r
4.23 q

1962 Allyn & Bacon, Inc. Boston.
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publisher.

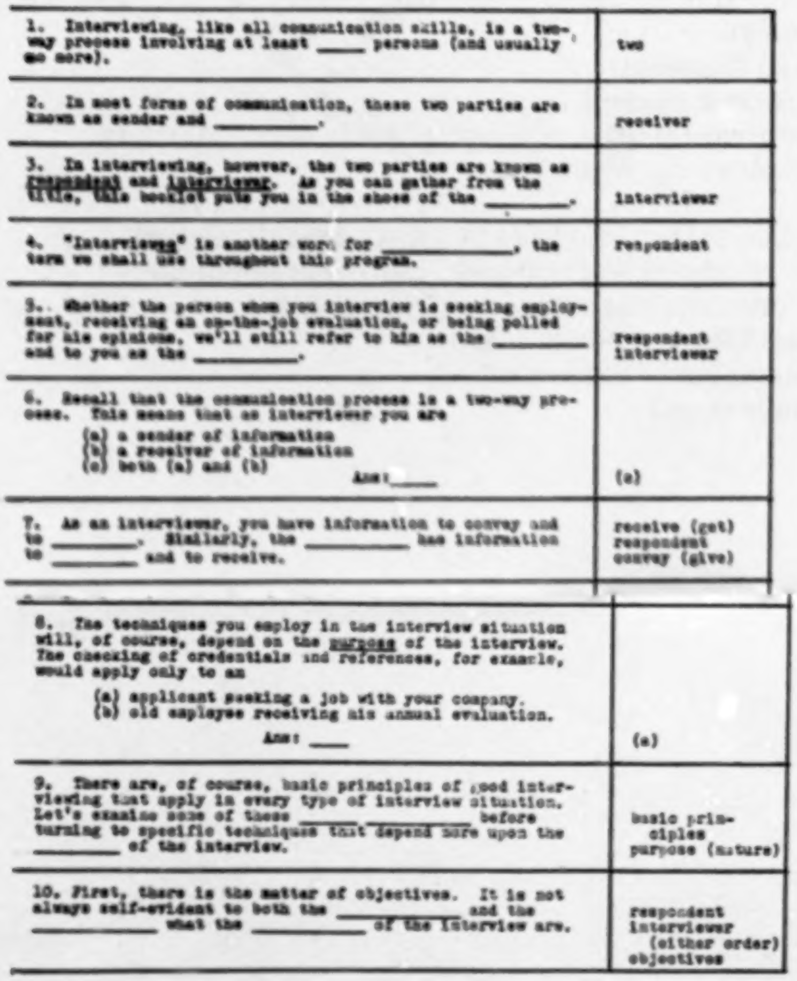
CONDUCTING AN INTERVIEW
(Number Five in the Management Skills Series)
WILLIAM PAUL
SCOTT B. PARRY, both of Scott B. Parry & Associates
Published by LORD PRODUCTS INC.,
28 West 22nd Street, New York 10, N.Y.

Programed text, 300 frames, paperback, 155 pp., 4" x 11", $6.95.
Table of Contents.
Final Test included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION:
"College undergraduates, male and female."
Prerequisites: High school verbal ability.
Average Time: 4 hours (est.).
Next Revision: "Unknown."
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

CONDUCTING AN INTERVIEW
Paul, Parry; LORD PRODUCTS
one sample page:



1. Interviewing, like all communication skills, is a two-way process involving at least ____ persons (and usually no more).	two
2. In most forms of communication, these two parties are known as sender and _________.	receiver
3. In interviewing, however, the two parties are known as respondent and interviewer. As you can gather from the title, this booklet puts you in the shoes of the _________.	interviewer
4. "Interviewee" is another word for ___________, the term we shall use throughout this program.	respondent
5. Whether the person whom you interview is seeking employment, receiving an on-the-job evaluation, or being polled for his opinions, we'll still refer to him as the _________ and to you as the _________.	respondent interviewer
6. Recall that the communication process is a two-way process. This means that as interviewer you are (a) a sender of information (b) a receiver of information (c) both (a) and (b) Ans: ____	(c)
7. As an interviewer, you have information to convey and to ________. Similarly, the _________ has information to ________ and to receive.	receive (get) respondent convey (give)
8. The techniques you employ in the interview situation will, of course, depend on the purpose of the interview. The checking of credentials and references, for example, would apply only to an (a) applicant seeking a job with your company. (b) old employee receiving his annual evaluation. Ans: ____	(a)
9. There are, of course, basic principles of good interviewing that apply in every type of interview situation. Let's examine some of these _____ _________ before turning to specific techniques that depend more upon the ________ of the interview.	basic principles purpose (nature)
10. First, there is the matter of objectives. It is not always self-evident to both the __________ and the __________ what the _________ of the interview are.	respondent interviewer (either order) objectives

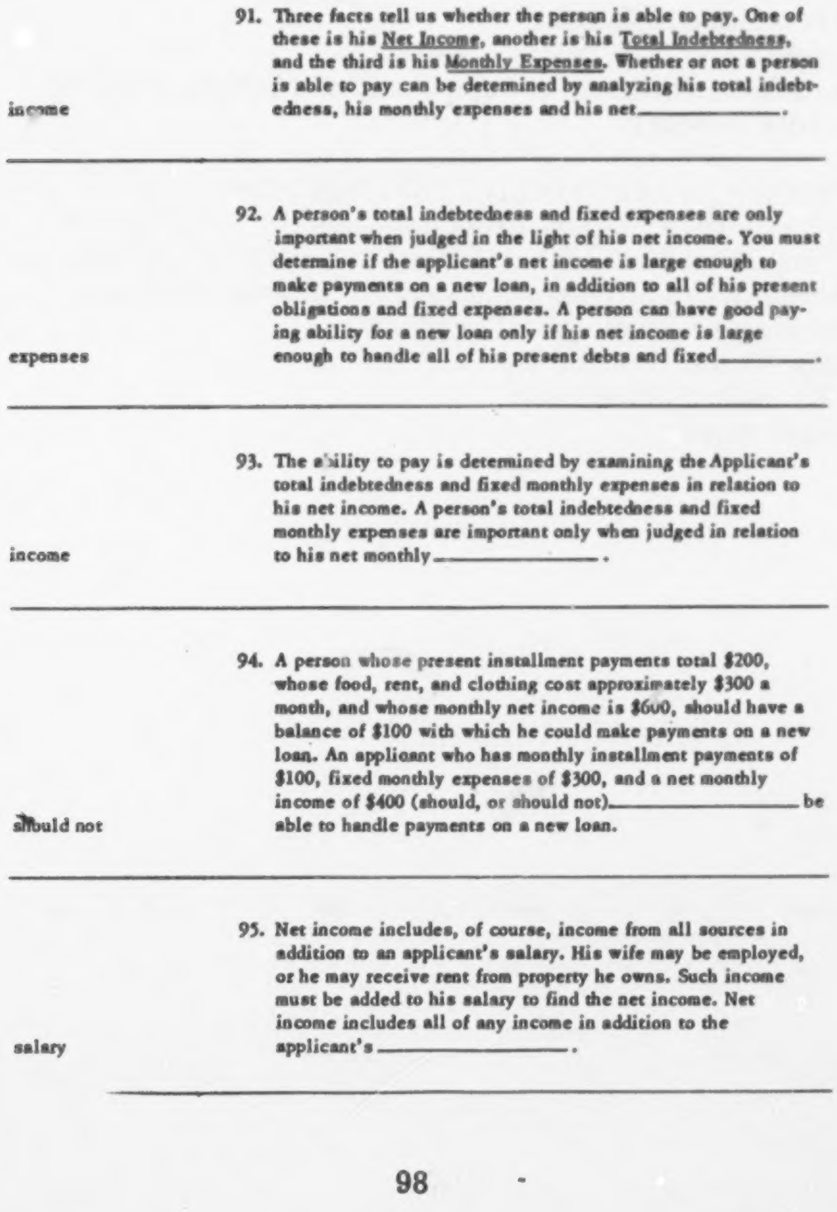
CONSUMER FINANCE
Credit Judgment
MARSHALL ARKY, et al., Roto Vue
Published by MODEL PUBLISHING Company,
1602-08 Hodiamont St., St. Louis, Missouri

Programed text, 800 frames, paperback, 150 pp., 8 1/2"x11", available in 3 separate units at $5.00 each.
Answer Sheets included.
Unit and Diagnostic Test(s) available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Employees in eight branch offices for development. Controlled field test involving over fifty employees in three dozen offices of nationwide finance company."
Prerequisites: High school graduate.
Average Time: 7 hours (est.).
Next Revision: June, 1963.
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

CONSUMER FINANCE
Arky; MODEL PUBLISHING
one sample page:



income	91. Three facts tell us whether the person is able to pay. One of these is his Net Income, another is his Total Indebtedness, and the third is his Monthly Expenses. Whether or not a person is able to pay can be determined by analyzing his total indebtedness, his monthly expenses and his net____________.
expenses	92. A person's total indebtedness and fixed expenses are only important when judged in the light of his net income. You must determine if the applicant's net income is large enough to make payments on a new loan, in addition to all of his present obligations and fixed expenses. A person can have good paying ability for a new loan only if his net income is large enough to handle all of his present debts and fixed________.
income	93. The ability to pay is determined by examining the Applicant's total indebtedness and fixed monthly expenses in relation to his net income. A person's total indebtedness and fixed monthly expenses are important only when judged in relation to his net monthly____________.
should not	94. A person whose present installment payments total $200, whose food, rent, and clothing cost approximately $300 a month, and whose monthly net income is $600, should have a balance of $100 with which he could make payments on a new loan. An applicant who has monthly installment payments of $100, fixed monthly expenses of $300, and a net monthly income of $400 (should, or should not)______________ be able to handle payments on a new loan.
salary	95. Net income includes, of course, income from all sources in addition to an applicant's salary. His wife may be employed, or he may receive rent from property he owns. Such income must be added to his salary to find the net income. Net income includes all of any income in addition to the applicant's____________.

BUSINESS EDUCATION & ECONOMICS Coll.+

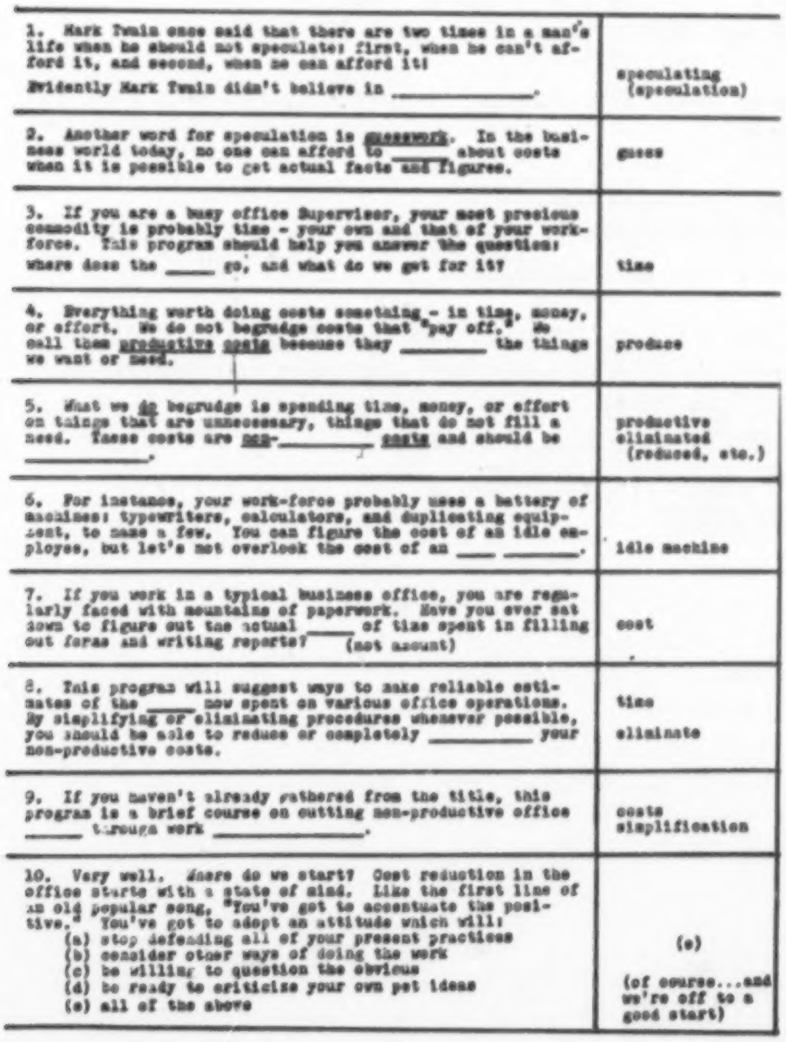
CUTTING OFFICE COSTS THROUGH WORK SIMPLIFICATION
(Number Four in the Management Skills Series)
ELMER V. GRILLO, New York University; Staff Assistant, Metropolitan Life Insurance Co.
Published by LORD PRODUCTS, Inc.,
28 West 22nd Street, New York 10, N.Y.

Programed text, 320 frames, paperback, 165 pp., 4" x 11", $6.95.
Table of Contents.
Final Test included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATIONS(S):
"Employees in two national business organizations."
Prerequisites: High school graduate.
Averate Time: 3-1/2 hours (est.).
Next Revision: "Unknown."
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

CUTTING OFFICE COSTS THROUGH WORK SIMPLIFICATION
Grillo; LORD PRODUCTS
one sample page:



1. Mark Twain once said that there are two times in a man's life when he should not speculate: first, when he can't afford it, and second, when he can afford it! Evidently Mark Twain didn't believe in ____________.	speculating (speculation)
2. Another word for speculation is guesswork. In the business world today, no one can afford to ______ about costs when it is possible to get actual facts and figures.	guess
3. If you are a busy office Supervisor, your most precious commodity is probably time - your own and that of your work-force. This program should help you answer the question: where does the _____ go, and what do we get for it?	time
4. Everything worth doing costs something - in time, money, or effort. We do not begrudge costs that "pay off." We call them productive costs because they ________ the things we want or need.	produce
5. What we do begrudge is spending time, money, or effort on things that are unnecessary, things that do not fill a need. These costs are non-__________ costs and should be ___________.	productive eliminated (reduced, etc.)
6. For instance, your work-force probably uses a battery of machines: typewriters, calculators, and duplicating equipment, to name a few. You can figure the cost of an idle employee, but let's not overlook the cost of an ___ _______.	idle machine
7. If you work in a typical business office, you are regularly faced with mountains of paperwork. Have you ever sat down to figure out the actual _____ of time spent in filling out forms and writing reports? (not amount)	cost
8. This program will suggest ways to make reliable estimates of the _____ now spent on various office operations. By simplifying or eliminating procedures whenever possible, you should be able to reduce or completely __________ your non-productive costs.	time eliminate
9. If you haven't already gathered from the title, this program is a brief course on cutting non-productive office _____ through work _____________.	costs simplification
10. Very well. Where do we start? Cost reduction in the office starts with a state of mind. Like the first line of an old popular song, "You've got to accentuate the positive." You've got to adopt an attitude which will: (a) stop defending all of your present practices (b) consider other ways of doing the work (c) be willing to question the obvious (d) be ready to criticize your own pet ideas (e) all of the above	(e) (of course...and we're off to a good start)

BUSINESS EDUCATION & ECONOMICS Adult

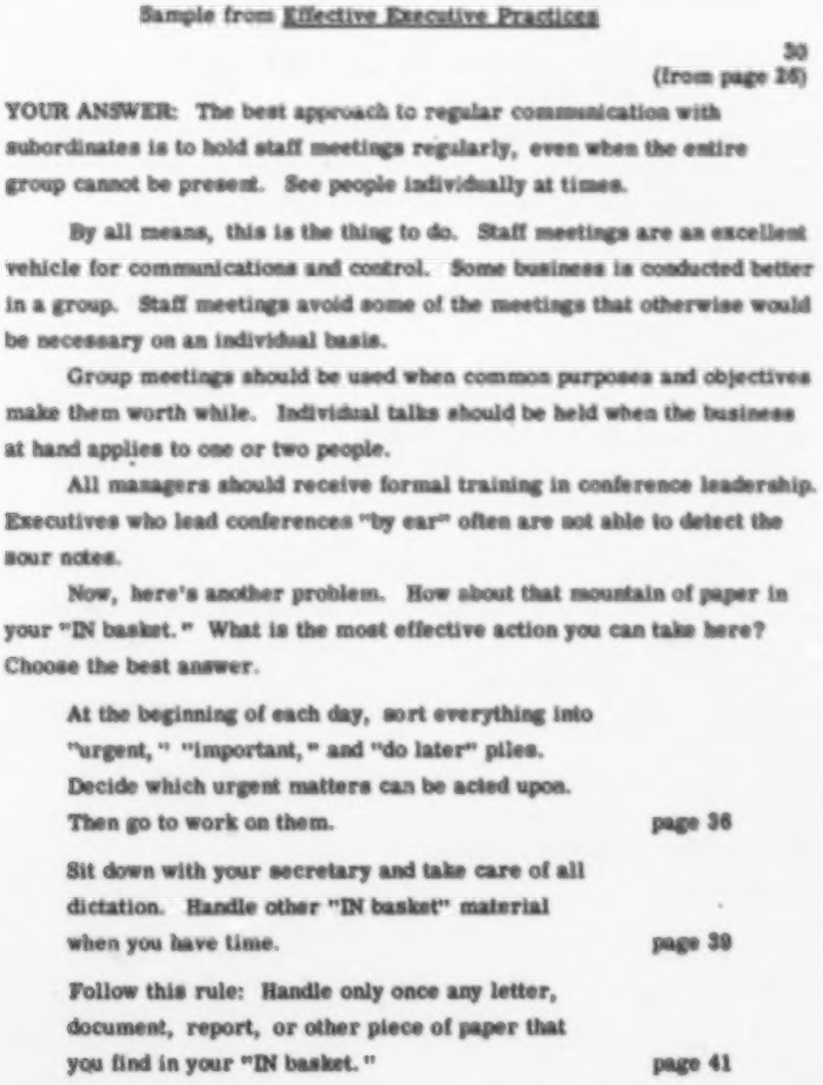
EFFECTIVE EXECUTIVE PRACTICES
NEELY D. GARDNER, Deputy Director of Water Resources in Calif.
Published by: DOUBLEDAY & COMPANY, Inc.,
575 Madison Avenue, New York City

Programed text, 354 frames, 362 pp., hard cover, 8 1/4" x 5 3/8", $4.95.
(A similar program, A SHORT COURSE IN EFFECTIVE EXECUTIVE PRACTICES, is available in TM format from: EDUCATIONAL SCIENCE DIV.,
U.S. INDUSTRIES, Inc.,
250 Park Avenue, New York City.
For use in AUTOTUTOR MARK II, $1,250; program reusable, $95.00.)
Teacher's Manual available, free, for machine program.
Table of Contents, both programs; Index, programed text.
Unit Test(s) available, machine program.
No Constructed Responses, Multiple Choice Responses and Branching always used.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"California state administrators at middle and upper supervisory levels; middle and upper management, various defense firms."
Prerequisite: "High school education; some management experience."
Average Time: 5-7 hours (est.), programed text; 3-6 hours (est.), machine.
Next Revision: Undetermined.
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

EFFECTIVE EXECUTIVE PRACTICES
Gardner; DOUBLEDAY & COMPANY
one sample page:



Sample from Effective Executive Practices

30
(from page 26)

YOUR ANSWER: The best approach to regular communication with subordinates is to hold staff meetings regularly, even when the entire group cannot be present. See people individually at times.

By all means, this is the thing to do. Staff meetings are an excellent vehicle for communications and control. Some business is conducted better in a group. Staff meetings avoid some of the meetings that otherwise would be necessary on an individual basis.

Group meetings should be used when common purposes and objectives make them worth while. Individual talks should be held when the business at hand applies to one or two people.

All managers should receive formal training in conference leadership. Executives who lead conferences "by ear" often are not able to detect the sour notes.

Now, here's another problem. How about that mountain of paper in your "IN basket." What is the most effective action you can take here? Choose the best answer.

At the beginning of each day, sort everything into "urgent," "important," and "do later" piles. Decide which urgent matters can be acted upon. Then go to work on them. page 36

Sit down with your secretary and take care of all dictation. Handle other "IN basket" material when you have time. page 39

Follow this rule: Handle only once any letter, document, report, or other piece of paper that you find in your "IN basket." page 41

BUSINESS EDUCATION & ECONOMICS H.S.+

FUNDAMENTALS OF FINANCE AND INVESTMENT
TECHNICAL STAFF, General Education, Inc.
Published by GENERAL EDUCATION, Inc.,
96 Mount Auburn Street, Cambridge 38, Mass.

For use in SELF-TUTOR machine, program reusable,
3000 frames, $30.00 (machine and program)
Teacher's Manual available, free.
Table of Contents.
Unit Test(s) available, free.
Constructed Responses usually used; some Multiple
Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

"Potential applicants for the National Association of Securities Dealers qualifying examination were used as subjects. Approximately 15 were used as subjects. Testing was administered with cheat-proof teaching machines under supervised conditions. The program was revised until terminal behavior questions could be answered correctly and until a negligible error rate was achieved. Program is accompanied by a set of 600 terminal behavior questions which may be used to evaluate the program and to assess student progress."

Prerequisites: None.
Average Time: 30 hours (est.).
Next Revision: "None planned at present."
(3 sample pages)

BUSINESS EDUCATION & ECONOMICS

FUNDAMENTALS OF FINANCE AND INVESTMENT
Technical Staff; GENERAL EDUCATION
3 sample pages:

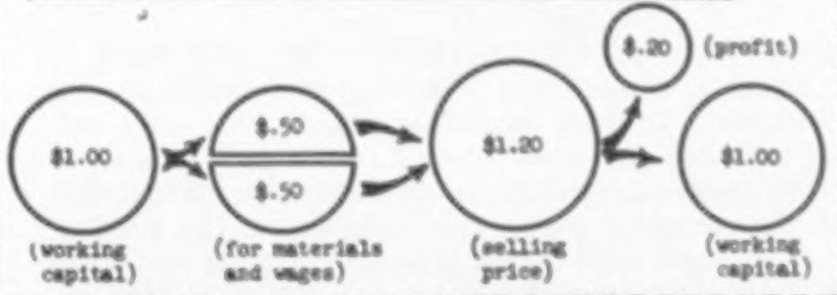
Excerpt from

Section A: CORPORATE FINANCE I

(132 frames)

EXHIBIT A-1

$1.00 OF WORKING CAPITAL CIRCULATING THROUGH WIDGET COMPANY


$1.00
(working capital)
$.50
$.50
(for materials and wages)
$1.20
(selling price)
$.20
(profit)
$1.00
(working capital)

A7. Mr. Edison needs working capital -- the capital needed day by day, week by week, to keep his plant working until he is paid for the widgets he is making. Working capital is money needed to buy . . . (a new factory/a swimming pool for Mr. Edison's wife/materials and pay wages).	materials and pay wages
A8. Exhibit A-1 shows the circulation of $1 of working capital through Widget Co. 50¢ is spent on __________ and 50¢ on __________ to make a widget. The $1 of working capital . . . (is/is not) used up to make a widget.	materials; wages; is
A9. The widget made with this $1.00 or working capital sells for $______. Widget Co. . . . (has/does not have) its $1.00 of working capital back now, plus a 20¢ profit.	$1.20; has

Excerpt from

Section I: SECURITIES EXCHANGES

(193 frames)

EXHIBIT I-2

```
(a)  GM
        54 1/4

(b)  X
        5s57

(c)  PA
        2000s25

(d)  CRR.III  Pr
               53

(e)  GM Pr
          3 3/4 2s99 1/2
```

166. Exhibit I-2 consists of reports of transactions as they would be printed on the tape. The price at which a security sold is printed in points . . . (above/below) the coded name of the security.	below
167. In Exhibit I-2 (a), GM means General Motors common stock. At what price did General Motors common trade as reported in Exhibit I-2 (a)? (answer in points)	54 1/4
168. Only round lot transaction are reported on the tape. Odd lot transactions . . . (are/are not) reported on the ticker tape.	are not

Excerpt from

Section P: INTRODUCTION TO INVESTMENT COMPANIES

(194 frames)

P107. An investment company may be described in terms of its investment purpose, as well as in terms of the class of securities in its portfolio. That is, funds . . . (vary/are the same) in what they try to accomplish for their investors.	vary
P108. An investment company generally invests its capital to seek either capital appreciation or for current income.	(No Answer Required)
P109. A fund which hopes to produce high . . . (current income/capital appreciation) for its investors would invest in high-yielding securities, whether these are bonds, preferred stocks, or common stocks.	current income
P110. The high-yielding securities in the portfolio of an "income fund" . . . (must/need not) be common stocks.	need not
P111. An income fund would probably invest in . . . (high-yielding/low-yielding) securities.	high-yielding

BUSINESS EDUCATION & ECONOMICS Coll. +

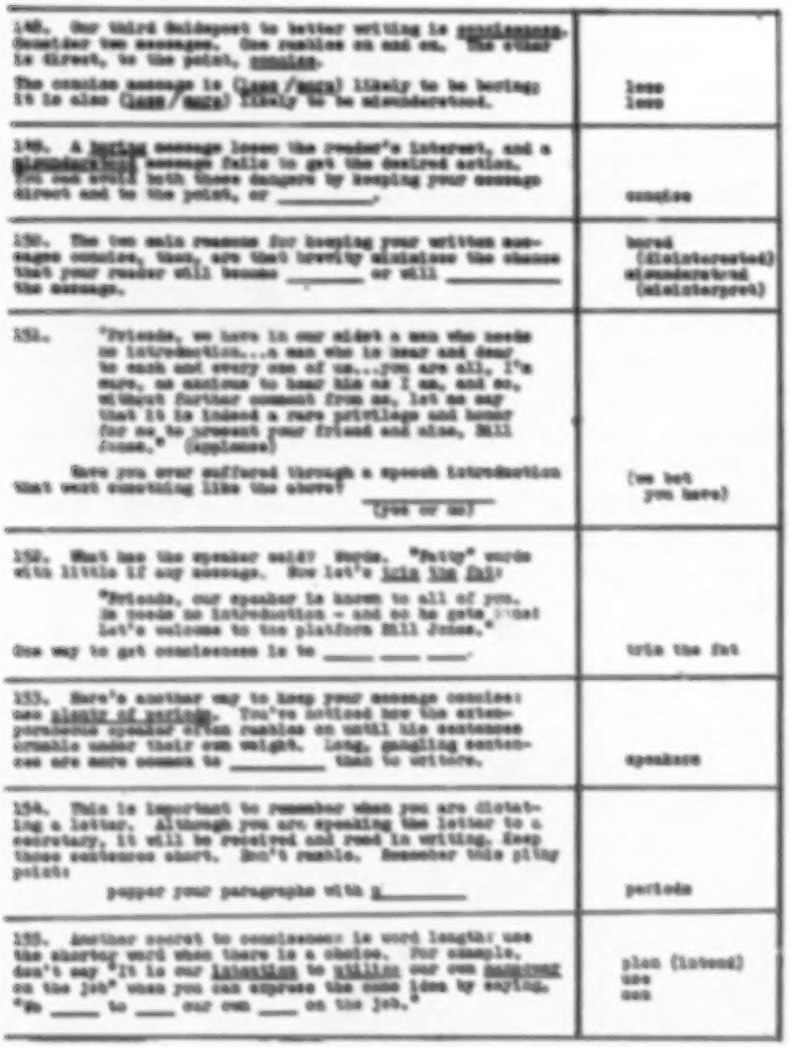
IMPROVING YOUR WRITTEN COMMUNICATIONS
(Number one in the Management Skills Series)
SCOTT B. PARRY, President, Scott B. Parry & Associates
Published by LORD PRODUCTS, Inc.,
28 West 22nd Street, New York 10, N. Y.

Programed text, 310 frames, paperback, 160 pp., 4" x 11", $6.95.
Table of Contents.
Final test included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Employees of three selected industries, faculty members of leading college offering communications program of study, students of same."
Prerequisites: High school equivalency in verbal ability.
Average Time: 4-1/2 hours (based entirely on data); standard deviation "not calculated, since range was too limited to warrant."
Next Revision: "Unknown."
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

IMPROVING YOUR WRITTEN COMMUNICATIONS
Parry; LORD PRODUCTS
one sample page:



INCREASING PRODUCTIVITY THROUGH THE SUPERVISOR
(Number Three in the Management Skills Series)
M. BERNSTEIN, Senior Programer, Scott B. Parry & Associates
Published by LORD PRODUCTS, Inc.
28 West 22nd Street, New York 10, N.Y.

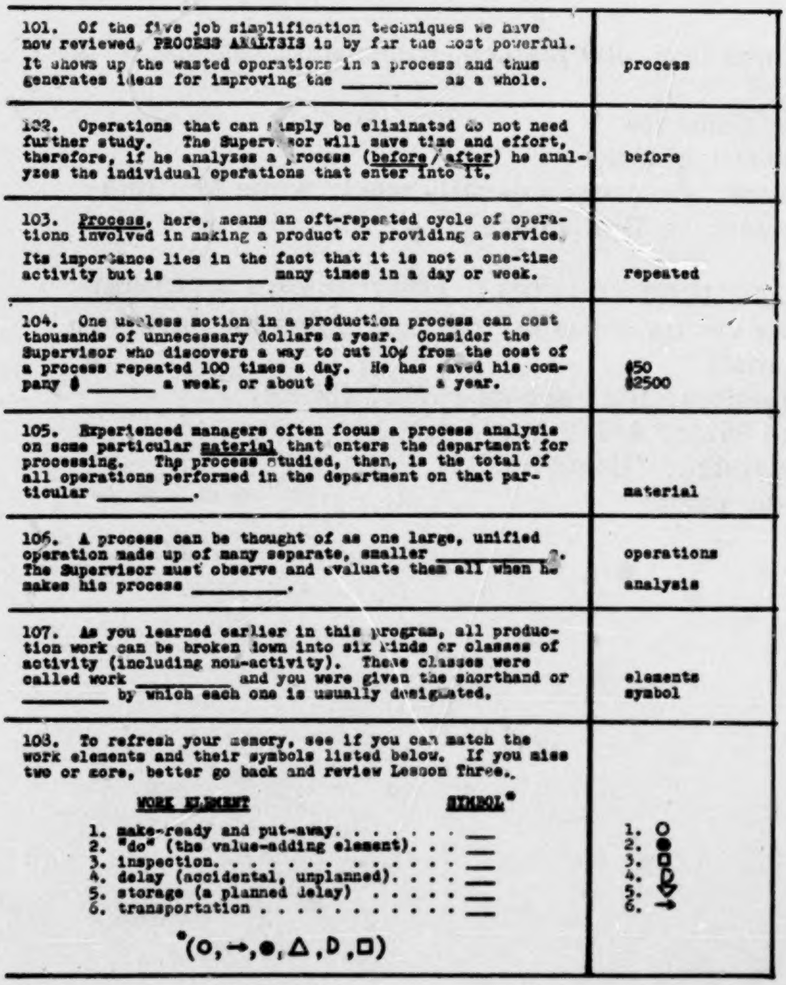
Programed text, 300 frames, paperback, 155 pp., 4" x 11", $6.95.
Table of Contents.
Final Test included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Not yet field tested, (college males for developmental)."
Prerequisites: High school verbal ability.
Average Time: 4-1/2 hours (est.).
Next Revision: "Unknown."
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

INCREASING PRODUCTIVITY THROUGH THE SUPERVISOR

Bernstein; LORD PRODUCTS
one sample page:



101. Of the five job simplification techniques we have now reviewed, PROCESS ANALYSIS is by far the most powerful. It shows up the wasted operations in a process and thus generates ideas for improving the ______ as a whole.	process
102. Operations that can simply be eliminated do not need further study. The Supervisor will save time and effort, therefore, if he analyzes a process (before / after) he analyzes the individual operations that enter into it.	before
103. Process, here, means an oft-repeated cycle of operations involved in making a product or providing a service. Its importance lies in the fact that it is not a one-time activity but is ______ many times in a day or week.	repeated
104. One useless motion in a production process can cost thousands of unnecessary dollars a year. Consider the Supervisor who discovers a way to cut 10¢ from the cost of a process repeated 100 times a day. He has saved his company $ ______ a week, or about $ ______ a year.	$50 $2500
105. Experienced managers often focus a process analysis on some particular material that enters the department for processing. The process studied, then, is the total of all operations performed in the department on that particular ______.	material
106. A process can be thought of as one large, unified operation made up of many separate, smaller ______s. The Supervisor must observe and evaluate them all when he makes his process ______.	operations analysis
107. As you learned earlier in this program, all production work can be broken down into six kinds or classes of activity (including non-activity). These classes were called work ______ and you were given the shorthand or ______ by which each one is usually designated.	elements symbol
108. To refresh your memory, see if you can match the work elements and their symbols listed below. If you miss two or more, better go back and review Lesson Three. WORK ELEMENT — SYMBOL* 1. make-ready and put-away. . . . . ___ 2. "do" (the value-adding element). . . ___ 3. inspection. . . . . ___ 4. delay (accidental, unplanned). . . . ___ 5. storage (a planned delay) . . . . . ___ 6. transportation . . . . ___ *(○, →, ●, △, D, □)	1. ○ 2. ● 3. □ 4. D 5. ▽ 6. →

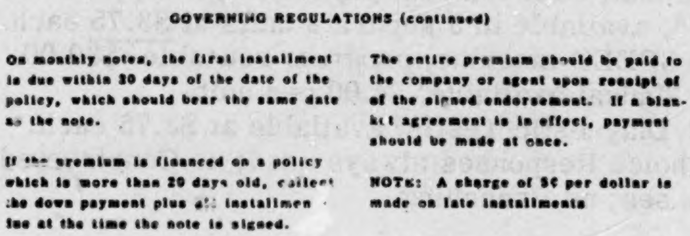
INSURANCE PREMIUM FINANCING
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 3240 frames, paperback, 108 pp., 5" x 7", available in 3 separate units at $3.75 each.
For use in SPEED machine, program reusable, $30.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available at $3.75 each.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED machine, $700 and $850.
Average Time: 5 hours (est.).
Next Revision:
(2 sample pages)

BUSINESS EDUCATION & ECONOMICS

INSURANCE PREMIUM FINANCING
EDUCATION ENGINEERING
2 sample pages:



GOVERNING REGULATIONS (continued)

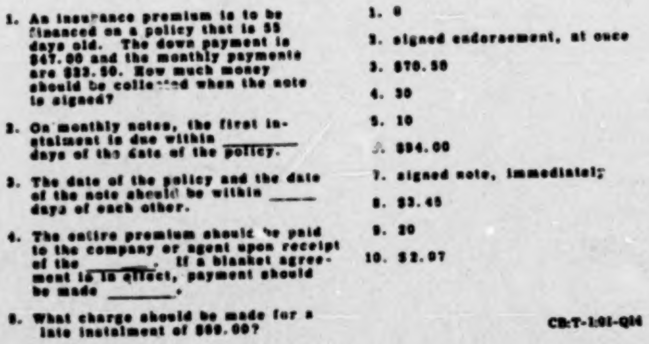
On monthly notes, the first installment is due within 20 days of the date of the policy, which should bear the same date as the note.

If the premium is financed on a policy which is more than 20 days old, collect the down payment plus all installments due at the time the note is signed.

The entire premium should be paid to the company or agent upon receipt of of the signed endorsement. If a blanket agreement is in effect, payment should be made at once.

NOTE: A charge of 5¢ per dollar is made on late installments

CR:T-1-01-S14



1. An insurance premium is to be financed on a policy that is 55 days old. The down payment is $47.00 and the monthly payments are $23.50. How much money should be collected when the note is signed?	1. 8
	2. signed endorsement, at once
	3. $70.50
	4. 30
2. On monthly notes, the first installment is due within ________ days of the date of the policy.	5. 10
	6. $94.00
3. The date of the policy and the date of the note should be within _____ days of each other.	7. signed note, immediately
	8. $3.45
4. The entire premium should be paid to the company or agent upon receipt of the ________. If a blanket agreement is in effect, payment should be made ________.	9. 20
	10. $2.07
5. What charge should be made for a late instalment of $69.00?	

CR:T-1:01-Q14

BLANKET AGREEMENTS (continued)

Blanket agreements will contain a provision that the insurance company will, when requested by the bank, cancel the policy on a pro-rata basis rather than the normal short-rate basis. The entire unearned premium will then be returned to the bank.

Since the blanket agreement can not cover the data on individual policies financed under it, a special endorsement will be used for each note to show the bank's interest in the policies or their proceeds.

All blanket agreements will be kept on file by the installment loan administration. Each time an office requests approval of a new loan, installment loan administration will ascertain the existence of a blanket agreement.

CB:T-1:01-S12

1. Blanket agreements will stipulate that policies cancelled by the bank will be on a ________ basis.
2. If the policy cancelled was on a ________ basis the bank would not get all of the unearned premium back.
3. Why is a special endorsement required on each note to show the banks interest in the policies and their proceeds?
4. Blanket agreements are kept on file by the ________.
5. When is the existence of a blanket agreement determined?

1. When approval of a new loan is requested.
2. short-rate
3. instalment loan administration
4. Because individual policies can not cover the data on individual blanket agreements.
5. insurance division
6. Blanket agreements can not cover the data on individual policies.
7. When the premium is sent to the insurance company.
8. When the policy goes into effect.
9. pro-rata
10. Because blanket agreements only guarantee cancellation conditions.

CB:T-1:01-Q12

BUSINESS EDUCATION & ECONOMICS H.S.+

PROGRAMMED BUSINESS MATHEMATICS: CONCEPTS, SKILLS, & APPLICATIONS. Parts I, II, III, and IV.

HARRY HUFFMAN, Professor of Business Education.
Published by GREGG PUBLISHING DIVISION, MCGRAW-HILL BOOK COMPANY, 330 West 42nd St., New York 36, N.Y.

Programed texts; Part I, 1,011 Frames; Part II, 767 Frames; Part III, 820 Frames; Part IV, 864 Frames; paperbacks; Part I, 214 pp.; Part II, 208 pp.; Part III, 224 pp.; Part IV, 208 pp.; 8-1/2" x 11", $2.25 each part.
Teacher's Manual available, $1.75.
Table of Contents.
Unit and Final Test(s) available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Individual testing—age 16 and up, I.Q. 95-110
Group testing—High school graduates enrolled in business colleges."
Prerequisites: "Senior in High School or high school graduate."
Average Time: 90-110 hours (est.).
Next Revision:
(3 sample pages)

BUSINESS EDUCATION & ECONOMICS

PROGRAMMED BUSINESS MATHEMATICS: CONCEPTS, SKILLS, & APPLICATIONS
Huffman; GREGG PUBLISHING DIVISION, McGRAW-HILL
3 sample pages:

76 **What are two methods of ensuring accuracy in addition?**

(1) ______________________

(2) ______________________

Any two of these: reverse addition, angular addition, subtotal addition, the estimation procedure.

HORIZONTAL ADDITION TO INCREASE SPEED * *

77 **Amounts horizontally arranged require skill in *horizontal* addition. *Without* recopying, add the ten amounts below.**

| .47 | .23 | .50 | .65 | .75 | .96 | :84 | .23 | .47 | .86 = __________ Total

This method of addition is known as __________ addition.

5.96 horizontal

78 **What term is applied to horizontal addition when it is first done from left to right and then done from right to left?**

__________ __________

Reverse addition

79 **The special skill in horizontal addition involves care in avoiding confusion in the units, tens, hundreds, and other places. Without recopying, add these two numbers.**

75,475 + 86,498 =

Can you use the procedure of reverse addition here? __________

161,973 yes

80 **Without recopying, add these two numbers horizontally.**

$147,650.90 + $237,486.45 = $__________

Verify by adding again horizontally.

Total = $__________

$385,137.35 $385,137.35

THE USE OF ALGEBRAIC SYMBOLS

63 **p, b, and r are called *algebraic* symbols.**

What branch of mathematics deals with *algebraic* symbols? ____________

algebra

64 **Business rule: Wages equal hours worked times pay rate.**

Stevens worked 37 hours and he earns $2.25 per hour.
Show how his wages are figured, but do not figure them.

$w =$ ____________ × ____________

$w = 37 \times 2.25$

65 **Rule: Wages earned equal hours worked times pay rate.**

Use the algebraic symbol w for wages earned, h for hours worked, and r for the pay rate. Now write the rule using the algebraic symbols.

____________ = ____________ × ____________

$w = h \times r$

66 **Ragan designates the goods available for sale in his Men's Shop as g.**

g = beginning inventory + purchases

How does Ragan calculate g? ____________________________

By adding the beginning inventory to purchases

67 **Rule: The sum of the beginning inventory and the purchases equals the goods available for sale.**

beginning inventory = b
purchases = p
goods available for sale = g

Now write the rule using algebraic symbols. ____________________________

$g = b + p$

87 **Smith is paid overtime on a weekly basis. He works 50 hours. His regular pay rate is $1.50 an hour and his overtime pay rate is $2.25 an hour.**

Regular hours ______________ **Regular pay** $______________

Overtime hours ______________ **Overtime pay** $______________

Gross pay $______________

Figure Smith's hours and his pay.

Regular hours, 40 **Regular pay, $60.00**
Overtime hours, 10 **Overtime pay, $22.50**
Gross pay, $82.50

88 **Marian Darby is paid overtime on a weekly basis. She is employed 6 days a week, and last week she worked 8 hours, 10 hours, 8 hours, 11 hours, 8 hours, and 5 hours. Regular pay is $2 an hour and overtime rate of pay $3 an hour. Figure her hours and pay.**

Regular hours ______________ **Regular pay** $______________

Overtime hours ______________ **Overtime pay** $______________

Gross pay $______________

Regular, 40 **Regular pay, $80.00**
Overtime, 10 **Overtime pay, $30.00**
Gross pay, $110.00

89 **Martha Melson is paid overtime on a weekly basis. The regular rate is $1.20; the overtime rate is $1.80.**

Complete this payroll register.

Employee	M	T	W	Th	F	S	Reg. Hrs.	O.T. Hrs.	Reg. Pay	O.T. Pay	Gross Pay
M. Melson	9	$7\frac{3}{4}$	$8\frac{1}{4}$	$10\frac{1}{2}$	8	$4\frac{1}{2}$					

Reg. Hrs.	O.T. Hrs.	Reg. Pay	O.T. Pay	Gross Pay
40	8	$48.00	$14.40	$62.40

90 **Sometimes overtime is paid on a daily basis. In this case, overtime pay is given for all time worked over 8 hours. Smith works for a company which pays overtime on a daily basis. If he works 10 hours, he is paid at the regular rate for the first ______________ hours and the overtime rate for the next ______________ hours.**

---

8 2

PROGRAMMED INSTRUCTION IN PERT AND CPM
DAVID E. MACKENZIE, PERT Project Manager
ALBERT E. HICKEY, President
SANFORD M. AUTOR, Director of Programing,
ENTELEK, Inc.
Published by ENTELEK INCORPORATED,
42 Pleasant Street, Newburyport, Massachusetts

Programed text, 700 frames (approx.), paperback in vinyl portfolio, 235 pp., 2 program sections at $17.50, Reference Section, $5.00, Vinyl Portfolio, $5.00.
Table of Contents.
Final test available, $.75 (includes grading).
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Industrial and military settings."
Prerequisites: None
Average Time: 15 hours (est.).
Next Revision: 1964.
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

PROGRAMMED INSTRUCTION IN PERT AND CPM
MacKenzie, Hickey, Autor; ENTELEK INCORPORATED
one sample page:

Now that we have the expected time for each individual activity in the project, let's calculate how long it will take to accomplish the entire ______ .

1

project

R 12

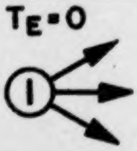
Turn to page R12. It's the same network at R10, we've just cleaned it up a little. To get total project time, begin with event ______ , by finding earliest event time (T_E).

2

1

No time has been expended prior to event 1, so indicate at event 1 that T_E is 0.

3



The time to reach event 2 is the expected time to complete activity 1,2, or ______ days.

4

2

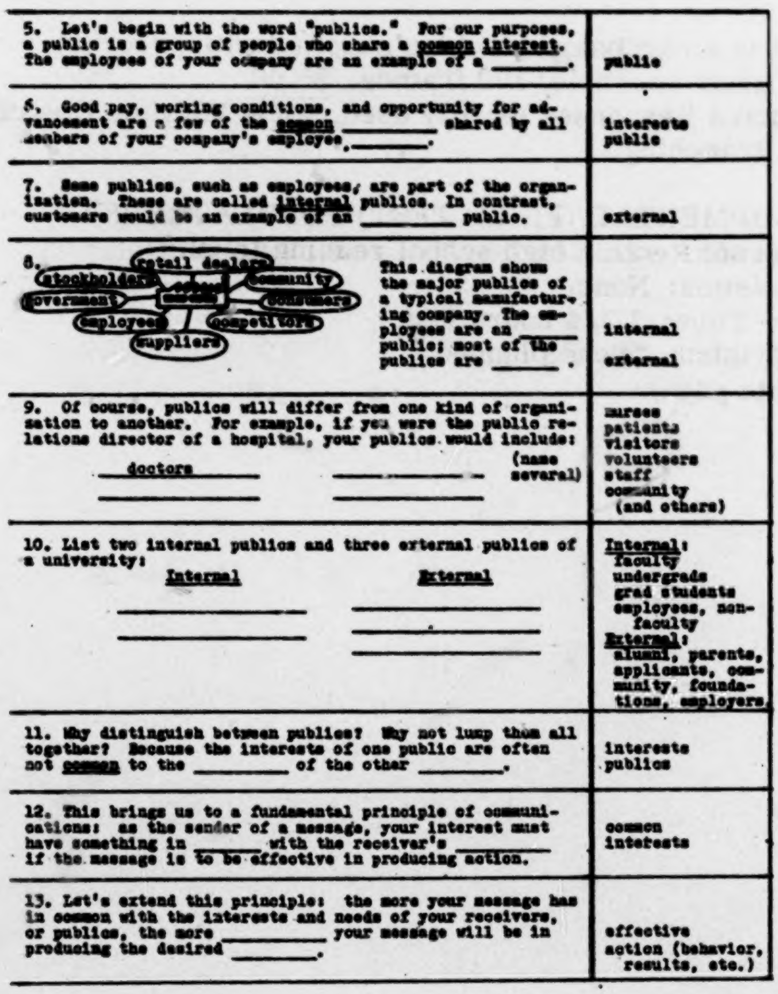
PUTTING PUBLIC RELATIONS TO WORK
(Number two in the Management Skills Series)
EDWARD J. ROBINSON, Chairman, Communications Research Center; President, New England Consultants, Inc.
Published by LORD PRODUCTS, Inc.
28 West 22nd Street, New York, New York

Programed text, 285 frames, paperback, 148 pp., 4" x 11", $6.95.
Table of Contents.
Final Test included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Students (96) in Boston University, selected faculty at same."
Prerequisites: High school graduate.
Average Time: 4 hours (est.).
Next Revision: "Unknown."
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

PUTTING PUBLIC RELATIONS TO WORK
Robinson; LORD PRODUCTS
one sample page:


retail dealers
stockholders
community
government
consumers
employees
competitors
suppliers

5. Let's begin with the word "publics." For our purposes, a public is a group of people who share a common interest. The employees of your company are an example of a ________.	public
6. Good pay, working conditions, and opportunity for advancement are a few of the common ________ shared by all members of your company's employee ________.	interests public
7. Some publics, such as employees, are part of the organization. These are called internal publics. In contrast, customers would be an example of an ________ public.	external
8. This diagram shows the major publics of a typical manufacturing company. The employees are an ______ public; most of the publics are ______ .	internal external
9. Of course, publics will differ from one kind of organization to another. For example, if you were the public relations director of a hospital, your publics would include: (name several) doctors ________ ________ ________	nurses patients visitors volunteers staff community (and others)
10. List two internal publics and three external publics of a university: Internal ________ ________ External ________ ________ ________	Internal: faculty undergrads grad students employees, non-faculty External: alumni, parents, applicants, community, foundations, employers.
11. Why distinguish between publics? Why not lump them all together? Because the interests of one public are often not common to the ________ of the other ________.	interests publics
12. This brings us to a fundamental principle of communications: as the sender of a message, your interest must have something in ______ with the receiver's ________ if the message is to be effective in producing action.	common interests
13. Let's extend this principle: the more your message has in common with the interests and needs of your receivers, or publics, the more ________ your message will be in producing the desired ________.	effective action (behavior, results, etc.)

BUSINESS EDUCATION & ECONOMICS H.S.+

THE SALESMAN'S CALL REPORT
How and Why It Should Be Completed Accurately.
TECHNICAL STAFF, General Education, Inc.
Published by GENERAL EDUCATION, Inc.,
96 Mount Auburn Street, Cambridge 38, Mass.

For use in a cardboard Machine supplied with program, program reusable, 190 frames. $5.00.
Constructed Responses usually used, some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Persons with a high school reading level."
Prerequisites: None.
Average Time: 1 3/4 hours (est.)
Next Revision: "None planned."
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

THE SALESMAN'S CALL REPORT
Technical Staff; GENERAL EDUCATION
one sample page:

18. Let's see why and to whom call reports are important. First of all call reports are important to you. Do you agree?	(Any answer is O.K.)
19. Maybe you said "Like hell! I don't agree!" Well, is money important to you?	(If you answered "No", you're sick, man, sick.)
20. The amount of money you make could be related to the quality of your call reports. So if money is important to you, c_____r_____are _____to you, too.	call reports; important
21. Don't scoff. Doesn't the amount of money you make depend upon how well you service your customers and, therefore, how willing they are to pay for your ser____and your co____'s products?	services; company's
22. Well, the cooperation you get from the home office is a vital part of your ability to service your accounts, which, when well serviced, help you to make money. So coop_____from the home office helps you to make m_____.	cooperation; money
23. The cooperation you get often depends on the quality of your call reports. It's not surprising that . . . (good/poor) call reports get you more cooperation than . . . (good/poor) call reports.	good; poor

BUSINESS EDUCATION & ECONOMICS

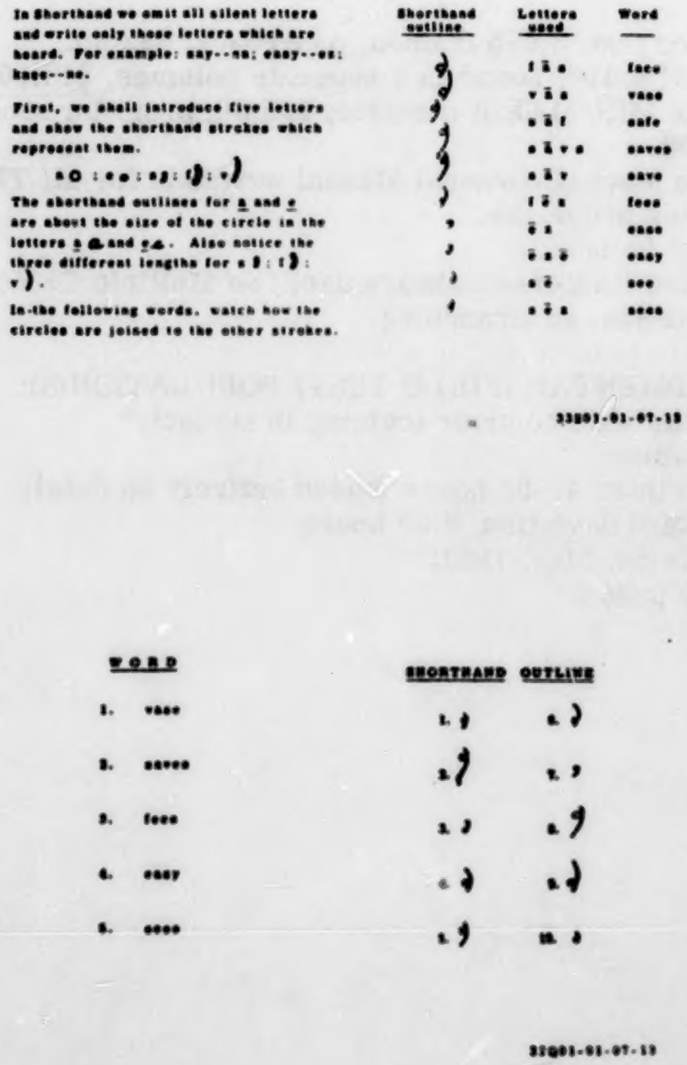
SHORTHAND 33
AUDREY V. BOYD, Programer
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 10,800 frames, paperback, 360 pp.,
5" x 7", available in 10 separate units at $3.75 each.
For use in SPEED machine, program reusable, $100.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED teaching machine,
$700 & $850.
Average Time: 12 hours (est.).
Next Revision:
(1 sample page)

BUSINESS EDUCATION & ECONOMICS

SHORTHAND 33
Boyd; EDUCATION ENGINEERING
one sample page:



In Shorthand we omit all silent letters and write only those letters which are heard. For example: say--sa; easy--es; knee--ne.

First, we shall introduce five letters and show the shorthand strokes which represent them.

a ○ : e ● : s : f : v

The shorthand outlines for a and e are about the size of the circle in the letters a and e. Also notice the three different lengths for s : f : v.

In the following words, watch how the circles are joined to the other strokes.

Shorthand outline	Letters used	Word
	f ā s	face
	v ā s	vase
	s ā f	safe
	s ā v s	saves
	s ā v	save
	f ē s	fees
	ē s	ease
	ē s ē	easy
	s ē	see
	s ē s	sees

33Q01-01-07-13

WORD	
1.	vase
2.	saves
3.	fees
4.	easy
5.	sees

SHORTHAND OUTLINE

1. 6.
2. 7.
3. 8.
4. 9.
5. 10.

33Q01-01-07-13

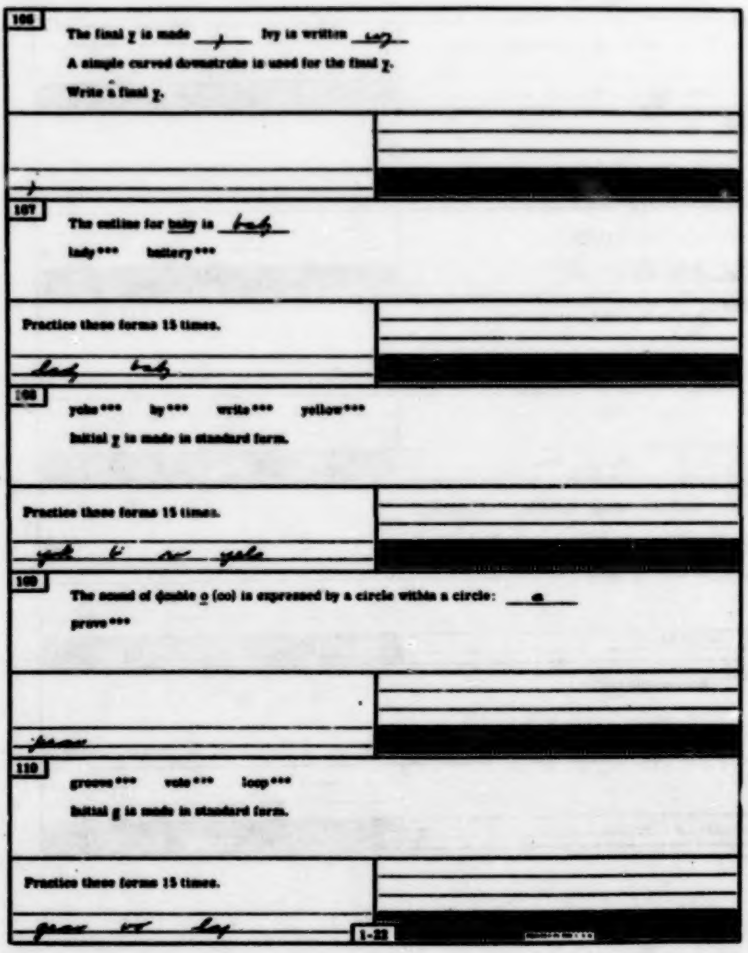
STENOSPEED, AN "ABC" SHORTHAND
JAMES L. EVANS
PAUL H. CARLSON, both of Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 3,075 frames, paperback, 632 pp., 8 1/2" x 11", bound in 3 separate volumes, $13.50.
For use in MIN/MAX II machine, $25.00; program reusable, $12.50.
Teacher's Manual: General Manual available for all TMI-Grolier programs.
Final Test included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Adults with no prior training in subject."
Prerequisites:
Average Time: 45-55 hours (based entirely on data); standard deviation, 6.09 hours.
Next Revision: May, 1963.
(3 sample pages)

BUSINESS EDUCATION & ECONOMICS

STENOSPEED, AN "ABC" SHORTHAND
Evans, Carlson; TEACHING MATERIALS CORPORATION
3 sample pages:



106

The final y is made ____ Ivy is written ____

A simple curved downstroke is used for the final y.

Write a final y.

107

The outline for baby is ____

lady*** battery***

Practice these forms 15 times.

108

yoke*** by*** write*** yellow***

Initial y is made in standard form.

Practice these forms 15 times.

109

The sound of double o (oo) is expressed by a circle within a circle: ____

prove***

110

groove*** vote*** loop***

Initial g is made in standard form.

Practice these forms 15 times.

1-22

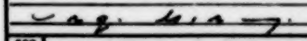
501

The brief form for are, our and hour is

We are good. ***

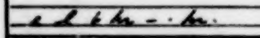
This is our money. ***

Practice the form for are, our and hour 15 times.



502

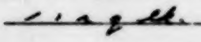
He will be here in an hour. ***



503

It is about an hour from now. ***

504

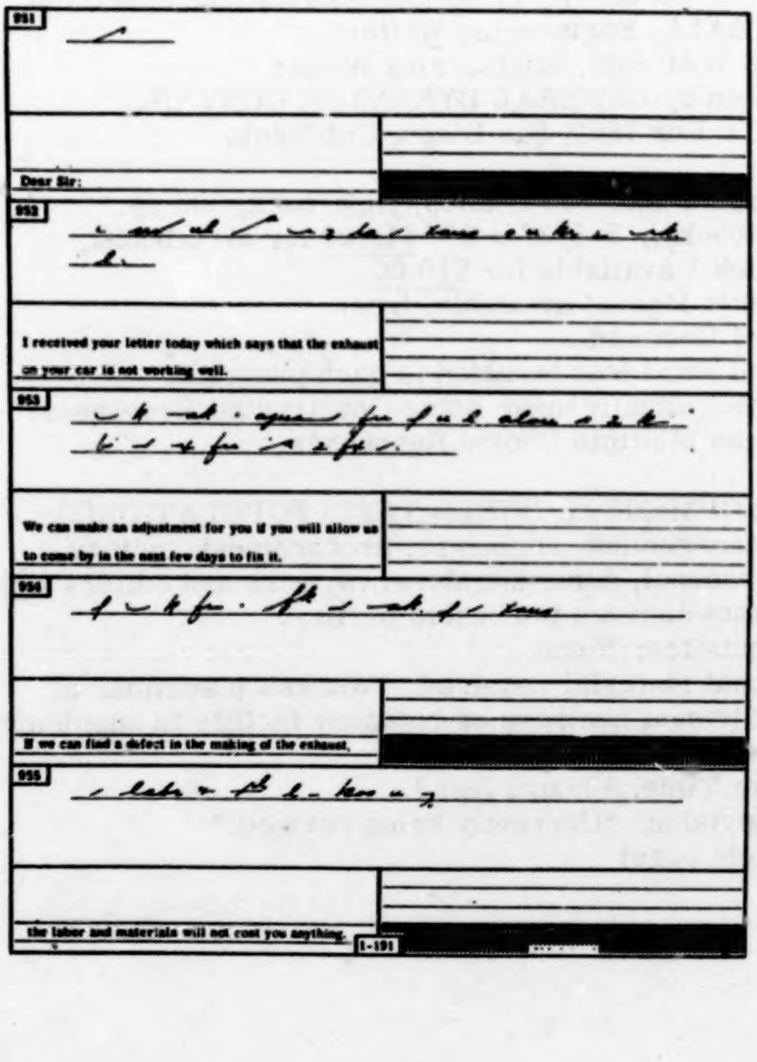
 ***

It is our good luck.

505

Are you with him? ***

1-101



951

Dear Sir:

952

I received your letter today which says that the exhaust on your car is not working well.

953

We can make an adjustment for you if you will allow us to come by in the next few days to fix it.

954

If we can find a defect in the making of the exhaust,

955

the labor and materials will not cost you anything.

1-191

BUSINESS EDUCATION & ECONOMICS Adult

VALUE CONTROL
Value Engineering; Value Analysis
JAC D. MEACHAM, Publications Editor
CHARLES M. KEYS, Technical Publications Specialist
DALE BALL, Engineering Writer
CHOCK WAGERS, Engineering Writer
Published by GENERAL DYNAMICS, CONVAIR,
P.O. Box 1950, San Diego, California

Programed text, 350 frames, paperback, 333 pp. (5 books), 5 1/2" x 8", $15.00 for all 5 books, Book 1 available for $10.00.
Teacher's Manual available, free.
Table of Contents.
Unit and Final test included in each program.
Branching usually used; some Constructed Responses; some Multiple Choice Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Management, engineers, procurement, factory personnel, administrators...writers and editors and miscellaneous interested parties."
Prerequisites: None
Additional material required: "Workshop seminar at individual business or company facility to supplement instruction."
Average Time: 8 hours (est.).
Next Revision: "Currently being revised."
(1 sample page)

VALUE CONTROL
Meacham, Keys, Ball, Wagers; GENERAL DYNAMICS, CONVAIR
one sample page:

PI-2-4

SELF-TEST (CONT)

10. When selecting the best ideas is there a limit to the number that can be selected?

☐ Yes

☐ No

11. Which of the following is used to make the first selection of best ideas?

    a. Design information.
    b. Knowledge and good judgment.
    c. Manufacturing capabilities.
    d. Specialty Vendor.

12. When gathering data to make a comparison for the purpose of selecting the best idea from the usable category, which of the following areas must be researched?

    a. Engineering.
    b. All areas affected by the project.
    c. Manufacturing.
    d. Specialty Vendor.
    e. Quality Control.

13. What two factors must be present in a quality product?

    a. M________________
    b. R________________

14. Final selection of the best idea is made by C________________.

63

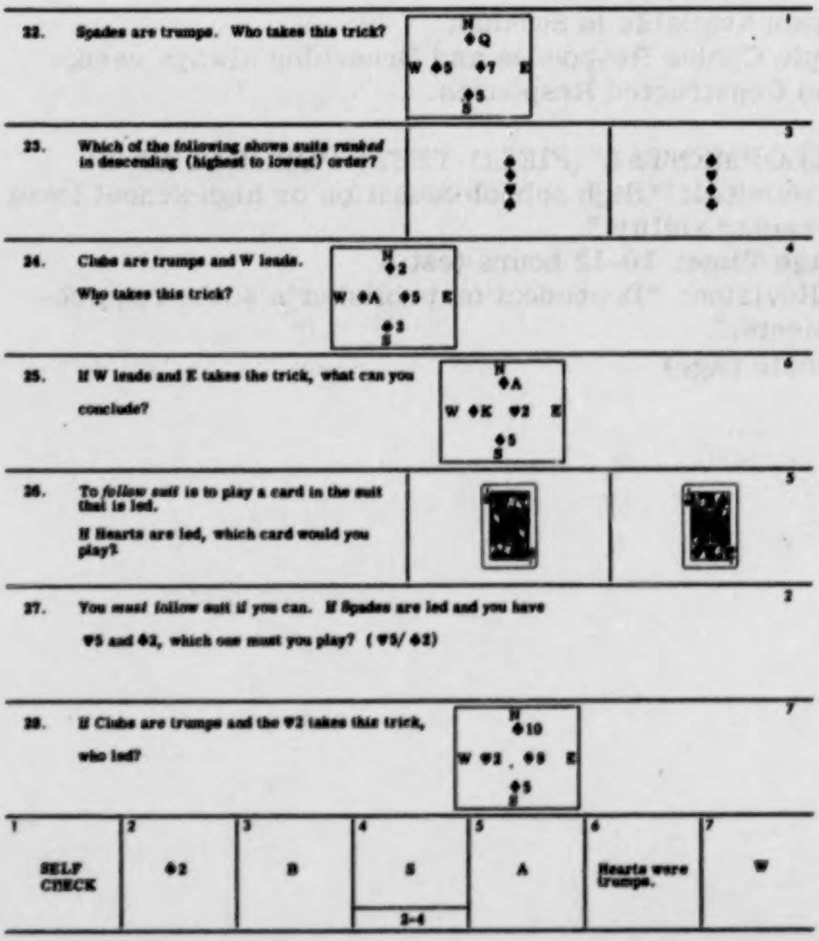
BRIDGE
JAMES L. EVANS
EDWARD RICKERT, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 1,451 frames, paperback, 362 pp., 8 1/2" x 11", $11.00.
For use in MIN/MAX II machine, $25.00; program reusable, $10.00.
Teacher's Manual: General Manual for all TMI-Grolier programs available.
Table of Contents.
Unit and Final Test(s) included.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"9th and 10th graders and adults who had no prior knowledge of the subject."
Prerequisites:
Average Time: 15-20 hours (based entirely on data); standard deviation, 7.11 hours.
Next Revision:
(1 sample page)

GAMES

BRIDGE
Evans, Rickert; TEACHING MATERIALS CORPORATION
one sample page:



22. Spades are trumps. Who takes this trick?

N
♠Q
W ♠5 ♠7 E
♠5
S

23. Which of the following shows suits *ranked* in descending (highest to lowest) order?

24. Clubs are trumps and W leads.

Who takes this trick?

N
♣2
W ♦A ♦5 E
♣3
S

25. If W leads and E takes the trick, what can you conclude?

N
♦A
W ♦K ♥2 E
♦5
S

26. To *follow suit* is to play a card in the suit that is led.

If Hearts are led, which card would you play?

27. You *must* follow suit if you can. If Spades are led and you have ♥5 and ♠2, which one must you play? (♥5/ ♠2)

28. If Clubs are trumps and the ♥2 takes this trick, who led?

N
♠10
W ♥2 ♠9 E
♠5
S

1	2	3	4	5	6	7
SELF CHECK	♠2	B	S 2-4	A	Hearts were trumps.	W

ELEMENTS OF BRIDGE
CHARLES H. GOREN, U. S. Bridge Authority
Published by DOUBLEDAY & COMPANY, Inc.
575 Madison Avenue, New York, New York

Programed text, 395 frames, hard cover, 417 pp.,
8-1/4" x 5-3/8", $4.95.
Table of Contents, Index.
Program available in Swedish.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: "High school education or high school level reading ability."
Average Time: 10-12 hours (est.).
Next Revision: "Dependent on publisher's sales requirements."
(1 sample page)

GAMES

ELEMENTS OF BRIDGE
Goren; DOUBLEDAY & COMPANY
one sample page:

Sample from The Elements of Bridge

1

We will begin at the beginning — by assuming that you are a stranger to a deck of cards.

A new deck normally contains fifty-four cards, fifty-two of which are used in bridge. The two cards not used are the two Jokers, which should be set aside.

It is customary in bridge to use two decks of cards, preferably with contrasting backs to keep them from becoming intermixed. While one deck is being dealt, or passed out for play, the other deck is being shuffled, or mixed, for future play. This saves time in the handling of cards and speeds up the game. Only one deck of cards is in play at a time.

The fifty-two cards used in playing bridge consist of four distinct suits, or sets, of thirteen cards each. There are

13 Spades ♠
13 Hearts ♡
13 Diamonds ♢
13 Clubs ♣

Spades and Clubs are the black suits, and Hearts and Diamonds are the red suits.

Now you are ready for the first question. Choose the answer that you think is correct and turn to the page number indicated after the answer you choose.

The game of bridge is played with:

Fifty-two cards in four suits and two Jokers.	page 6
Fifty-two cards in four suits.	page 11

CONTRACT BRIDGE FOR BEGINNERS
SHIRLEY B. BITTERLICH, Programer, General Programmed Teaching Corporation
ANNE BEACH, Editor, GPTC
JAMES E. LYNN, Subject Matter Expert
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

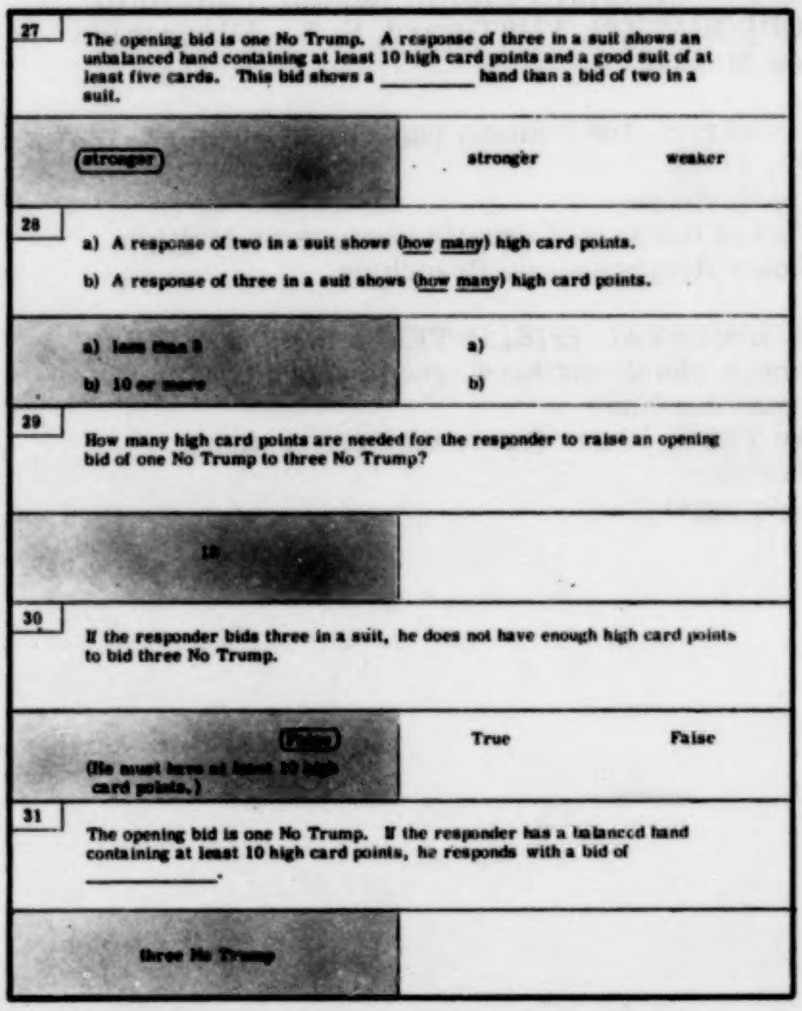
Programed text, 1866 frames, paperback, 373 pp., 8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: Teenage and adult. Field Testing: Adult."
Prerequisites: None
Additional material required: "Deck of playing cards."
Average Time: 17 hours (based entirely on data).
Next Revision:
(1 sample page)

GAMES

CONTRACT BRIDGE FOR BEGINNERS
Bitterlich, Beach, Lynn; ENCYCLOPAEDIA BRITANNICA PRESS

one sample page:



27 The opening bid is one No Trump. A response of three in a suit shows an unbalanced hand containing at least 10 high card points and a good suit of at least five cards. This bid shows a _________ hand than a bid of two in a suit.

stronger	stronger	weaker

28 a) A response of two in a suit shows (how many) high card points.

b) A response of three in a suit shows (how many) high card points.

a) less than 8 b) 10 or more	a) b)

29 How many high card points are needed for the responder to raise an opening bid of one No Trump to three No Trump?

10

30 If the responder bids three in a suit, he does not have enough high card points to bid three No Trump.

False (He must have at least 10 high card points.)	True	False

31 The opening bid is one No Trump. If the responder has a balanced hand containing at least 10 high card points, he responds with a bid of ____________.

three No Trump

HOW TO SCORE BOWLING
BARRY BARNES, Programer, GPTC
JEANNE K. DAVIS, Programer, GPTC
PETER M. CABRINKA, GPTC
BETTY LOU C. DUBOIS, Editor, General Programmed Teaching Corporation
Published by GENERAL PROGRAMMED TEACHING CORPORATION, 1719 Girard, N. E., Albuquerque, New Mexico.

Programed text, 180 frames, paperback, 30 pp., 8-1/2" x 11", $1.00.
Table of Contents.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

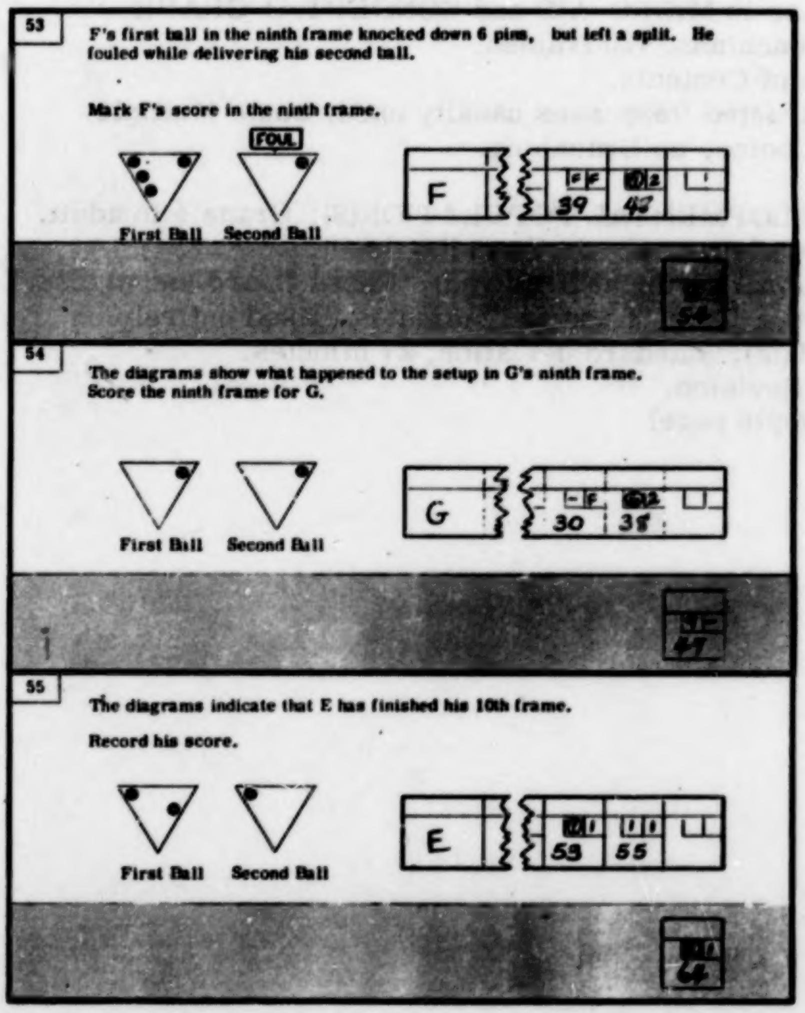
DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Those who do not know how to score bowling."
Prerequisites: None
Average Time: 1 hour (based entirely on data).
Next Revision:
(1 sample page)

GAMES

HOW TO SCORE BOWLING

Barnes, Davis, Cabrinka, Dubois; GENERAL PROGRAMMED TEACHING CORPORATION

one sample page:



53

F's first ball in the ninth frame knocked down 6 pins, but left a split. He fouled while delivering his second ball.

Mark F's score in the ninth frame.

FOUL
First Ball
Second Ball
F
F
F
39
2
48
54

54

The diagrams show what happened to the setup in G's ninth frame. Score the ninth frame for G.

First Ball
Second Ball
G
–
F
30
2
38
47

55

The diagrams indicate that E has finished his 10th frame.

Record his score.

First Ball
Second Ball
E
59
55
64

GAMES Open

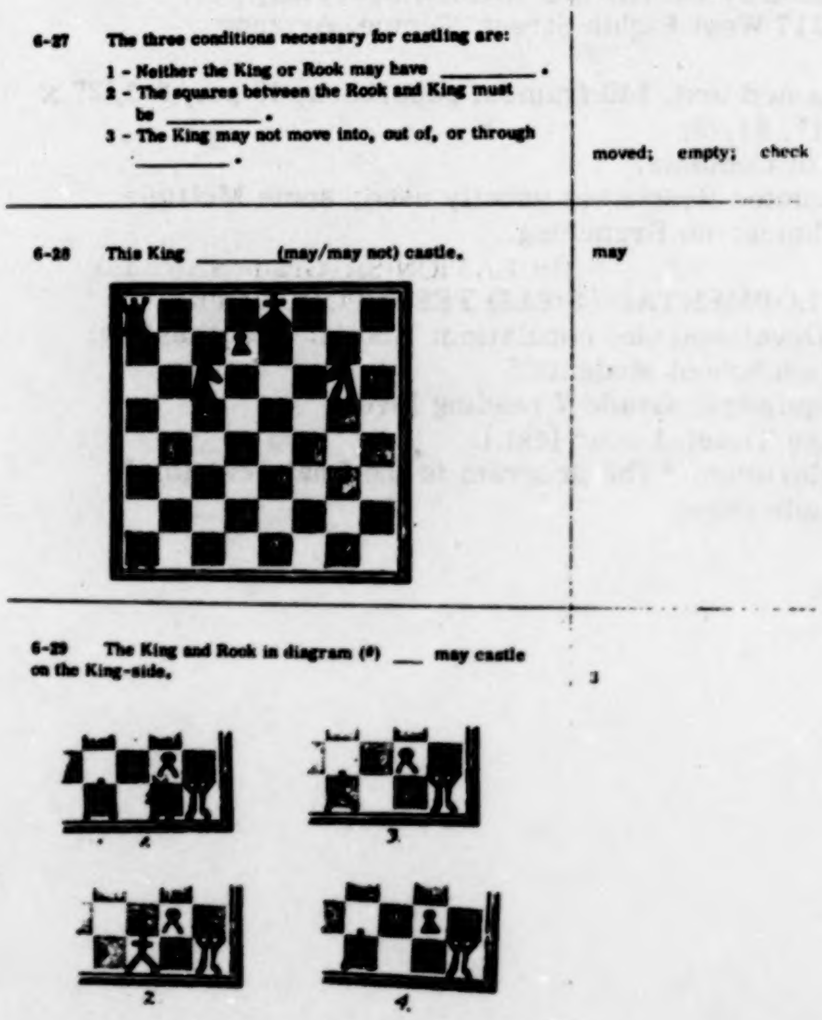
BEGINNING CHESS
CARL CHENEY, Programer, Learning, Incorporated
GEORGE KOLTANOWSKI, International Chess Master
Published by UNIVERSITY MICROFILMS, INC.,
313 North First Street, Ann Arbor, Michigan

For use in MICRO-AID and KONCEPT-O-GRAPH machines, 420 frames.
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL POPULATION(S): Grade 4 to adult.
Prerequisites: Grade 7 reading level.
Additional Material Required: "Chess Board and pieces."
Average Time: 4 hours 47 minutes (based entirely on data); standard deviation, 27 minutes.
Next Revision:
(1 sample page)

GAMES

BEGINNING CHESS
Cheney, Koltanowski: UNIVERSITY MICROFILMS
one sample page:



6-27 The three conditions necessary for castling are:

1 - Neither the King or Rook may have _________ .
2 - The squares between the Rook and King must be _________ .
3 - The King may not move into, out of, or through _________ .

moved; empty; check

6-28 This King ________(may/may not) castle.

may

6-29 The King and Rook in diagram (#) ___ may castle on the King-side.

3

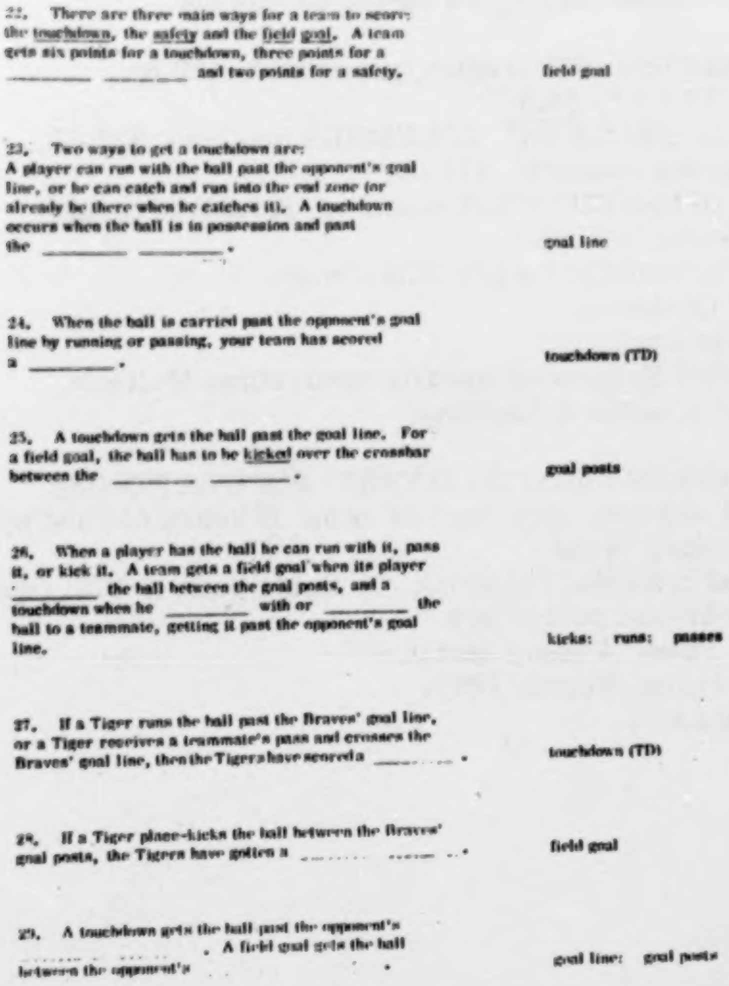
HOW TO WATCH A FOOTBALL GAME

SHEILA LEVINSKY, Programer, Learning, Inc.
FRANK KUSH, Head Football Coach, Arizona State University
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona

Programed text, 140 frames, paperback, 43 pp., 8-1/2" x 11", $1.75.
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental population: Adults. Field testing: High School students."
Prerequisites: Grade 7 reading level.
Average Time: 1 hour (est.).
Next Revision: "The program is the final revision."
(1 sample page)

HOW TO WATCH A FOOTBALL GAME
Levinsky, Kush; LEARNING INCORPORATED
one sample page:



22. There are three main ways for a team to score: the touchdown, the safety and the field goal. A team gets six points for a touchdown, three points for a ________ ________ and two points for a safety.	field goal
23. Two ways to get a touchdown are: A player can run with the ball past the opponent's goal line, or he can catch and run into the end zone (or already be there when he catches it). A touchdown occurs when the ball is in possession and past the ________ ________.	goal line
24. When the ball is carried past the opponent's goal line by running or passing, your team has scored a ________.	touchdown (TD)
25. A touchdown gets the ball past the goal line. For a field goal, the ball has to be kicked over the crossbar between the ________ ________.	goal posts
26. When a player has the ball he can run with it, pass it, or kick it. A team gets a field goal when its player ________ the ball between the goal posts, and a touchdown when he ________ with or ________ the ball to a teammate, getting it past the opponent's goal line.	kicks: runs: passes
27. If a Tiger runs the ball past the Braves' goal line, or a Tiger receives a teammate's pass and crosses the Braves' goal line, then the Tigers have scored a ________.	touchdown (TD)
28. If a Tiger place-kicks the ball between the Braves' goal posts, the Tigers have gotten a ________ ________.	field goal
29. A touchdown gets the ball past the opponent's ________ ________. A field goal gets the ball between the opponent's ________ ________.	goal line: goal posts

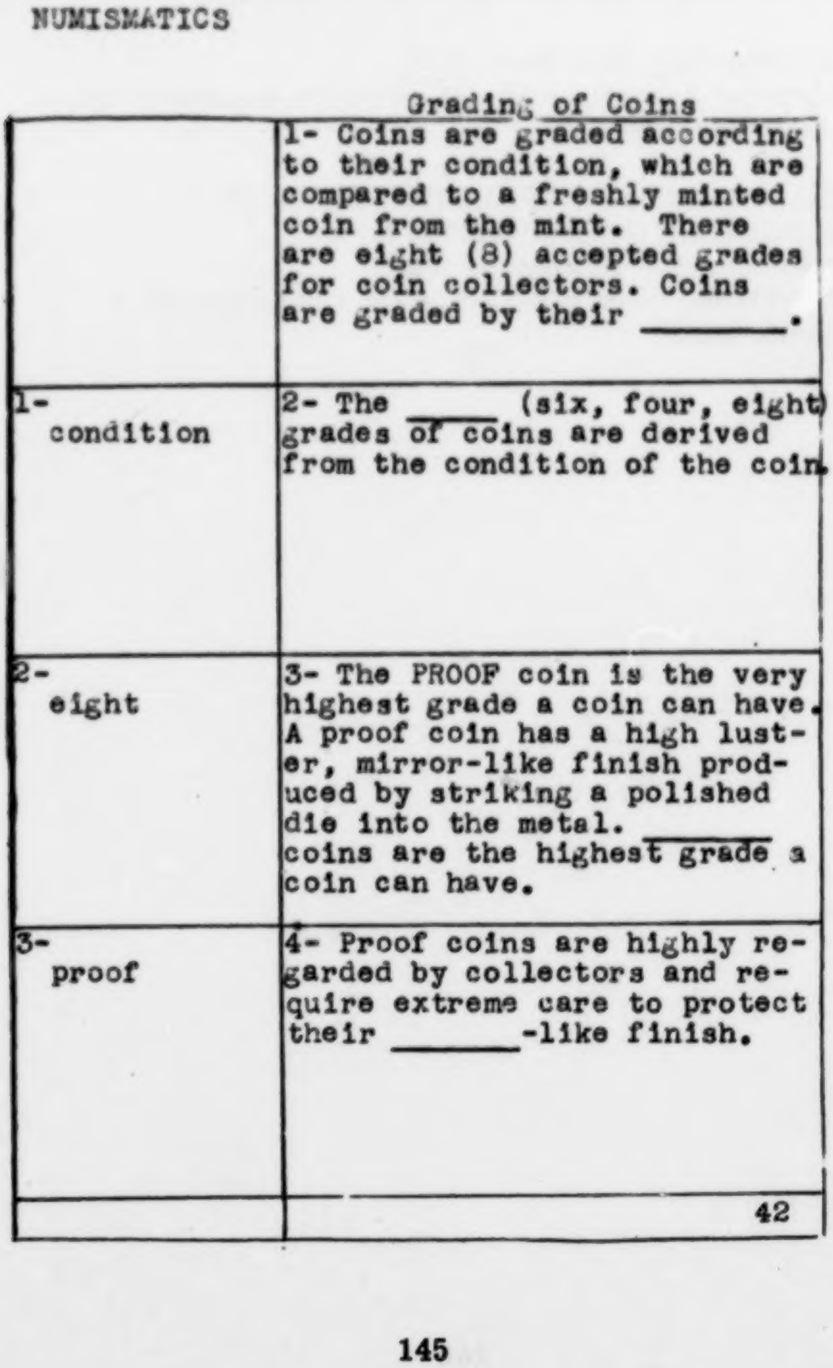
NUMISMATICS
A Guide for Coin Collectors
JAC D. MEACHAM, programmer
M. H. MONROE, numismatist
Published by GRAFICROLL SYSTEMS, Inc.,
4215 Calavo Drive, La Mesa, California

Programed text, 670 frames, paperback, 150 pp., 5 1/2" x 8", $4.95.
For use in DISCOVERY COLUMBUS machine, $38.95; program reusable, $15.00.
For use in EXECUTUTOR machine, $29.95; program reusable, $15.00.
For use in RHEEM CALIFONE device.
Table of Contents.
Final Test available.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Old and new collectors of coins 12 years old and up."
Prerequisites: None
Additional material required: "A Guide book of U.S. coins by Whitman publishers."
Average Time: 4 hours (est.).
Next Revision: March, 1963.
(1 sample page)

GAMES

NUMISMATICS
Meacham, Monroe; GRAFICROLL SYSTEMS
one sample page:



NUMISMATICS

Grading of Coins

	1- Coins are graded according to their condition, which are compared to a freshly minted coin from the mint. There are eight (8) accepted grades for coin collectors. Coins are graded by their ________.
1- condition	2- The _____ (six, four, eight) grades of coins are derived from the condition of the coin.
2- eight	3- The PROOF coin is the very highest grade a coin can have. A proof coin has a high luster, mirror-like finish produced by striking a polished die into the metal. _______ coins are the highest grade a coin can have.
3- proof	4- Proof coins are highly regarded by collectors and require extreme care to protect their _______-like finish.
	42

ROLLER SKATING SAFETY
DARLENE HARING, Programer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 20 frames, $.15.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL POPULATION(S): Grade 3.
Prerequisites: "Grade 3 reading level."
Average Time: 8-15 minutes (est.).
Next Revision: "The program is the final revision."
(1 sample page)

GAMES

ROLLER SKATING SAFETY
Haring; LEARNING INCORPORATED
one sample page:

4. Always take off your skates to cross a busy s t r _ _ t.	s t r e e t
5. To be safe, take off your skates before you c the s_______ .	cross, street
6. Don't fall on the stairs. You should take off your skates to go up and d_ _ _ _ _ the stairs.	down
7. Before you go up and down stairs, take your skates o	o f f
8. Take your skates off before you go up and down the s________ , and before you cross the s_ _ _ _ _ .	stairs, street

……

14. When we skate, it's better to be Safe Sam than Sorry Sally. Safety rules help us to be s _ _ _ .	s a f e
15. Remember these skating safety rules. Skate on the sidewalk, not on the ________ .	street
16. Always watch for ________ .	cars
17. Take off your skates before you ________ the ________ and before you go up and down the ________ .	cross, street, stairs
20. These safety rules can help you be like _ _ _ _ Sam, not like _ _ _ _ _ Sally.	Safe, Sorry

Draw Safe Sam. Draw Sorry Sally.

GRAMMAR & USAGE

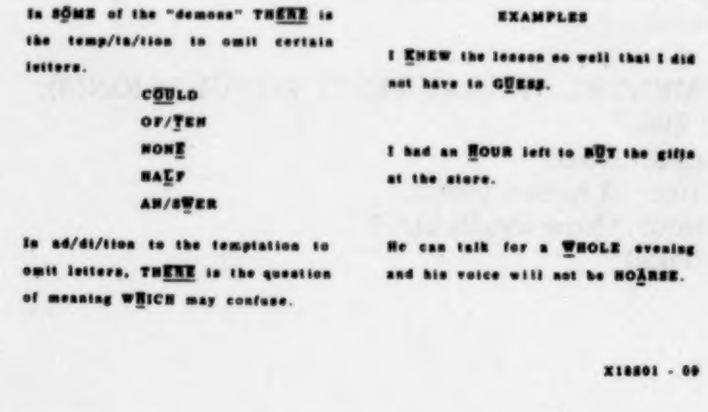
BASIC ENGLISH 37
GEORGE M. SNYDER, Programer
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 16,200 frames, paperback, 540 pp.,
5" x 7", available in 15 separate units at $3.75 each.
For use in SPEED machine, program reusable, $150.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED teaching machine, $700 & $850.
Average Time: 25 hours (est.).
Next Revision:
(1 sample page)

GRAMMAR & USAGE

BASIC ENGLISH 37
Snyder; EDUCATION ENGINEERING
one sample page:



In SOME of the "demons" THERE is the temp/ta/tion to omit certain letters.

COULD
OF/TEN
NONE
HALF
AN/SWER

In ad/di/tion to the temptation to omit letters, THERE is the question of meaning WHICH may confuse.

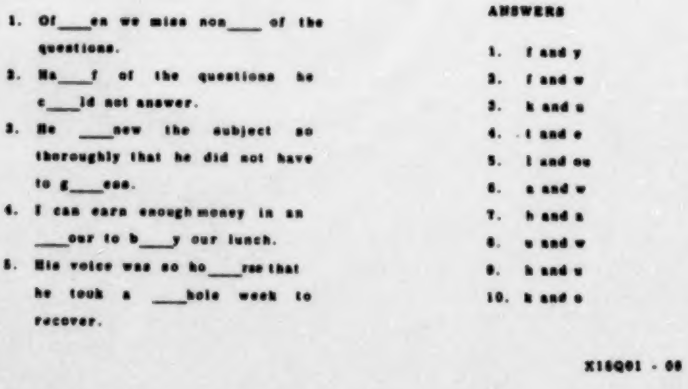
EXAMPLES

I KNEW the lesson so well that I did not have to GUESS.

I had an HOUR left to BUY the gifts at the store.

He can talk for a WHOLE evening and his voice will not be HOARSE.

X18S01 - 09



QUESTIONS

1. Of____en we miss non____ of the questions.
2. Ha____f of the questions he c____ld not answer.
3. He ____new the subject so thoroughly that he did not have to g____ess.
4. I can earn enough money in an ____our to b____y our lunch.
5. His voice was so ho____rse that he took a ____hole week to recover.

ANSWERS

1. f and y
2. f and w
3. k and u
4. t and e
5. l and ou
6. a and w
7. h and a
8. u and w
9. h and u
10. k and o

X18Q01 - 09

ENGLISH I and II

EMANUEL BIERMAN, programer, assistant principal, Queens, N. Y.

ALEXANDER SCHURE, President, N. Y. Institute of Technology

Published by CENTRAL SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95; program not reusable, 500 frames in I, 500 in II, I or II included in price of machine.

Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Over 200."

Prerequisites: None

Average Time: 3 hours (est.).

Next Revision: "Now available."

(1 sample page)

GRAMMAR & USAGE

ENGLISH I and II
Bierman, Schure; CENTRAL SCIENTIFIC COMPANY
one sample page:

ENGLISH II

34. A compound sentence can be divided into two simple sentences, each with a __________ and a __________.

. . . .

subject, predicate

35. We place the comma before the __________ in a compound sentence.

. . . .

conjunction

36. In a compound sentence, there is a subject and predicate both __________ and __________ the conjunction.

. . . .

before, after

37. A compound sentence is made up of two or more simple sentences which are closely related in thought.

a) Jones scored the touchdown, and he kicked the extra point.
b) Mary writes well, and her hair is brown.

In which sentence do the ideas fit better together.

Sentence a

GRAMMAR AND USAGE

ENGLISH 2600, REVISED EDITION Grades 9 & 10
A Programed Course in Grammar and Usage
ENGLISH 3200 Grades 11 & 12
JOSEPH C. BLUMENTHAL, former
Head of English Dept., Mackenzie High School,
Detroit, Michigan.
Published by HARCOURT, BRACE & WORLD, Inc.,
750 Third Avenue, New York 17, New York.

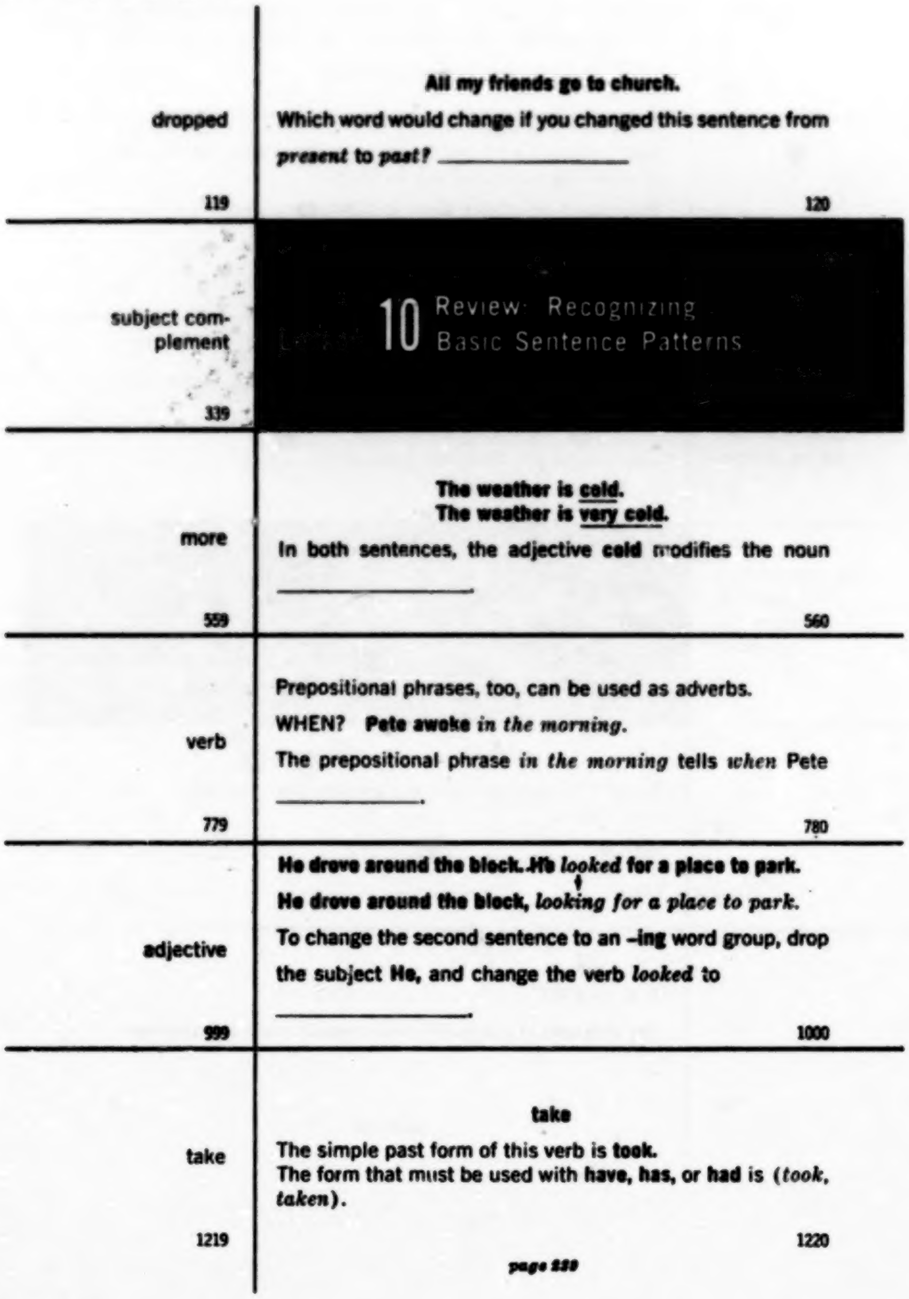
2600: programed text, 2632 frames, paperback and cloth cover, 448 pp., 6 3/8" x 9", $2.88 (paperback), $3.88 (cloth cover).*
3200: programed text, 3208 frames, hardcover and paperback, 544 pp., 6 1/4" x 9", $3.36 (paperback), $4.36 (hardcover).*
Teacher's Manual available; 2600: available without charge on class orders; 3200: $.60.
Table of Contents (both volumes).
Unit, Final, Diagnostic Test(s) available (both volumes).
2600: Constructed and Multiple Choice Responses usually used; no Branching.
3200: Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
2600: "Tested in many school districts throughout the country." 3200: "Three classes in New York City high schools."
Other using population(s): 2600: Grades 7-12. 3200: College freshmen, also grades 9 and 10.
Prerequisites: 2600: "None other than grade 9 reading level." 3200: "1 to 4 years of study of correct English."
Average Time: 2600: 8 to 14 hours (based entirely on data). 3200: 13-30 hours, average 22 hours (est.).
Next Revision: 3200: 1966.
(2 sample pages)

* A kit of forms for English 2600 and English 3200 "For Controlling Paper Work" is available from Developmental Corporation of America, 83 Clover Ave., Floral Park, N.Y.

GRAMMAR & USAGE

ENGLISH 2600, REVISED EDITION
ENGLISH 3200
Blumenthal; HARCOURT, BRACE & WORLD
2 sample pages:



dropped 119	**All my friends go to church.** Which word would change if you changed this sentence from ***present*** to ***past?*** ________________ 120
subject complement 339	Lesson 10 Review: Recognizing Basic Sentence Patterns
more 559	**The weather is cold.** **The weather is very cold.** In both sentences, the adjective **cold** modifies the noun ________________. 560
verb 779	Prepositional phrases, too, can be used as adverbs. WHEN? **Pete awoke** *in the morning.* The prepositional phrase *in the morning* tells *when* Pete ________________. 780
adjective 999	**He drove around the block. ~~He~~** ***looked*** **for a place to park.** **He drove around the block,** *looking for a place to park.* To change the second sentence to an **-ing** word group, drop the subject **He,** and change the verb ***looked*** to ________________. 1000
take 1219	**take** The simple past form of this verb is **took.** The form that must be used with **have, has,** or **had** is (*took, taken*). 1220

page 220

chairman

134

Henry is happy.

Henry was the chairman.

A verb like **is** or **was** is called a **linking verb** because it *links* a noun, pronoun, or adjective that follows it with the

_____ __________ of the sentence.

135

---

semicolon

402

When might we use a semicolon in preference to a conjunction? If there are too many *and*'s in a sentence, we may get rid of one by substituting a semicolon.

The patient asked for steak and potatoes, and the doctors and nurses were astonished.

How many **and**'s are there in this sentence? __________

403

Roxanne made a rude remark for which there was no excuse.

670

My sister works for Dr. Mack, and ***his office is downtown.***

____

____

671

We are planning a pageant to dramatize the history of our town.

938

Lesson 25 Subordination by Appositives

---

a

1206

The food was expensive and poor.

Supply the missing words to complete the "not only . . . but also" device:

Not only ______________________________,

but ______________________________.

1207

R-S

1474

S, F, **or** ***R-S?***

The only-one in our family who plays a musical instrument.

_____

1475

page 269

GRAMMAR & USAGE

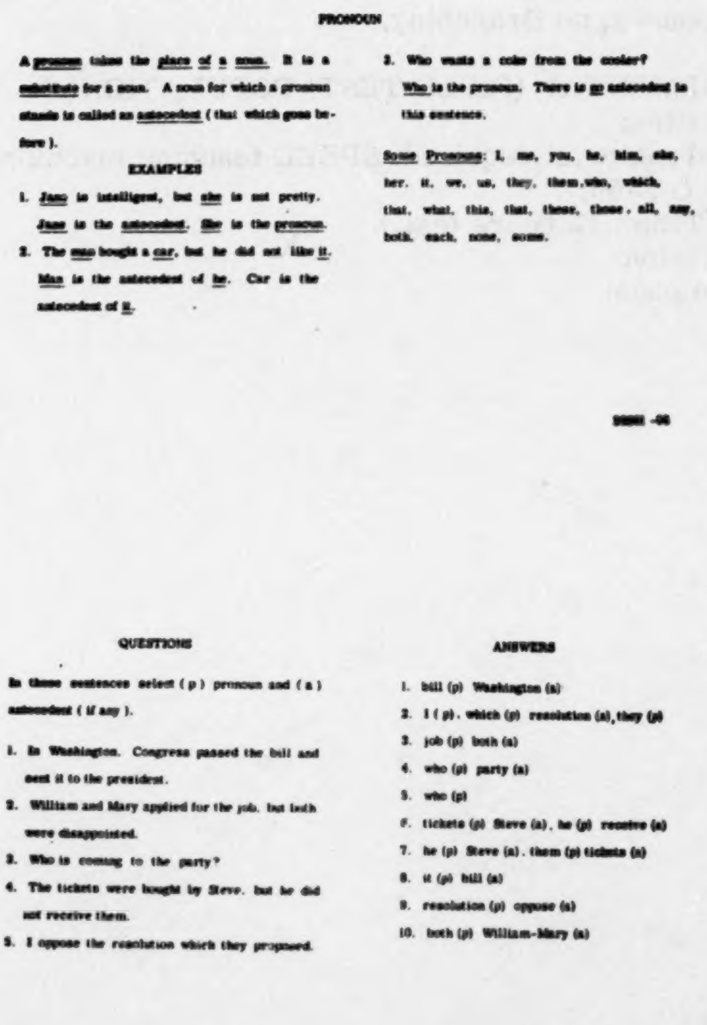
ENGLISH GRAMMAR 28
GEORGE M. SNYDER, Programer
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 6480 frames, paperback, 216 pp., 5" x 7", available in 6 separate units at $3.75 each.
For use in SPEED machine, program reusable, $60.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED teaching machine, $700 & $850.
Average Time: 12 hours (est.).
Next Revision:
(1 sample page)

GRAMMAR & USAGE

ENGLISH GRAMMAR 28
Snyder; EDUCATION ENGINEERING
one sample page:



PRONOUN

A pronoun takes the place of a noun. It is a substitute for a noun. A noun for which a pronoun stands is called an antecedent (that which goes before).

EXAMPLES

1. Jane is intelligent, but she is not pretty. Jane is the antecedent. She is the pronoun.
2. The man bought a car, but he did not like it. Man is the antecedent of he. Car is the antecedent of it.
3. Who wants a coke from the cooler? Who is the pronoun. There is no antecedent in this sentence.

Some Pronouns: I, me, you, he, him, she, her, it, we, us, they, them, who, which, that, what, this, that, these, those, all, any, both, each, none, some.

[illegible] -06

QUESTIONS

In these sentences select (p) pronoun and (a) antecedent (if any).

1. In Washington, Congress passed the bill and sent it to the president.
2. William and Mary applied for the job, but both were disappointed.
3. Who is coming to the party?
4. The tickets were bought by Steve, but he did not receive them.
5. I oppose the resolution which they proposed.

ANSWERS

1. bill (p) Washington (a)
2. I (p) , which (p) resolution (a), they (p)
3. job (p) both (a)
4. who (p) party (a)
5. who (p)
6. tickets (p) Steve (a) , he (p) receive (a)
7. he (p) Steve (a) , them (p) tickets (a)
8. it (p) bill (a)
9. resolution (p) oppose (a)
10. both (p) William-Mary (a)

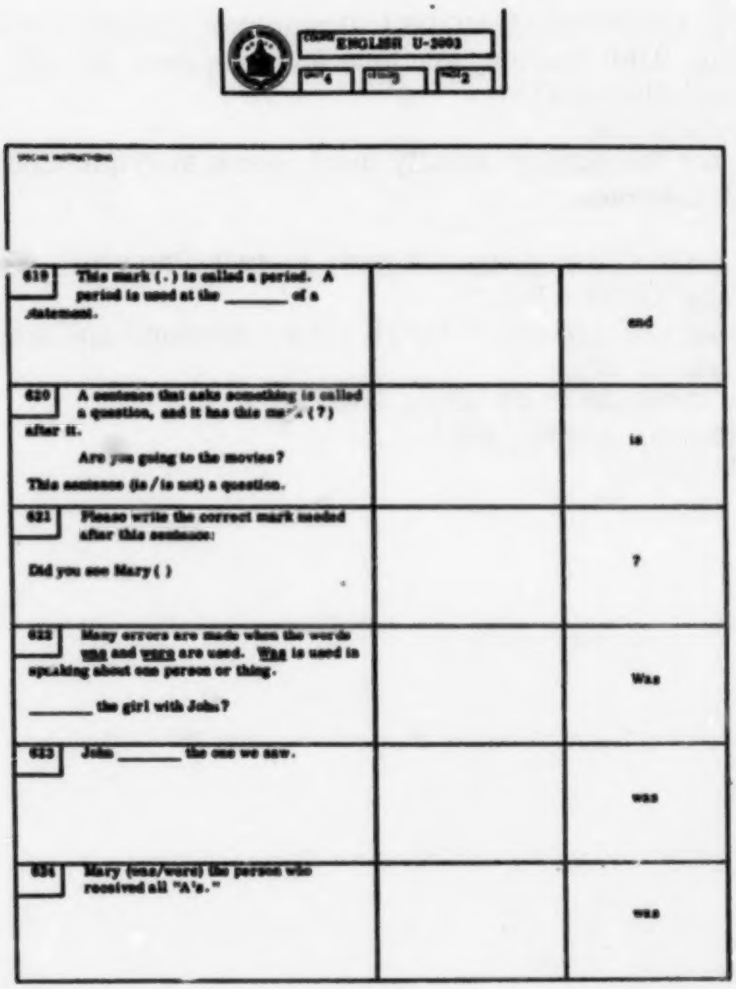
ENGLISH GRAMMAR U-3003
UNIVERSAL ELECTRONICS LABORATORIES CORPORATION
Published by UNIVERSAL TEACHING MACHINE INSTITUTE,
510 Hudson Street, Hackensack, New Jersey.

For use in UNIVERSAL MODEL U machine, program reusable, 2160 frames, machine and program, $25.00 (school discount).
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Grade Level - 5-9."
Other using population(s): "High school students and adults."
Prerequisites: None.
Average Time: 28 to 34 hours (est.).
Next Revision: August, 1963.
(2 sample pages)

GRAMMAR & USAGE

ENGLISH GRAMMAR U-3003
Universal Electronics Laboratories Corporation;
UNIVERSAL TEACHING MACHINE INSTITUTE
2 sample pages:



ENGLISH U-3003
4
3
2

VOCAL INSTRUCTIONS

619 This mark (.) is called a period. A period is used at the _______ of a statement.		end
620 A sentence that asks something is called a question, and it has this mark (?) after it. Are you going to the movies? This sentence (is / is not) a question.		is
621 Please write the correct mark needed after this sentence: Did you see Mary ( )		?
622 Many errors are made when the words was and were are used. Was is used in speaking about one person or thing. _______ the girl with John?		Was
623 John _______ the one we saw.		was
624 Mary (was/were) the person who received all "A's."		was

ENGLISH U-2002
4 | 3 | 5

637 Come sometimes needs a helping word, such as have, has, or had. How many children _______ come to the park? What helping word does come need in this sentence?		have have
638 Mary (has/have) come to find leaves. Write the correct helping word.		has
639 The children (have/has) come to the woods.		have
640 A word that does not need a helping word is came. She _______ to the party.		came
641 October (came/come) with red and yellow leaves.		came
642 Sometimes (come/came) needs a helping word.		come

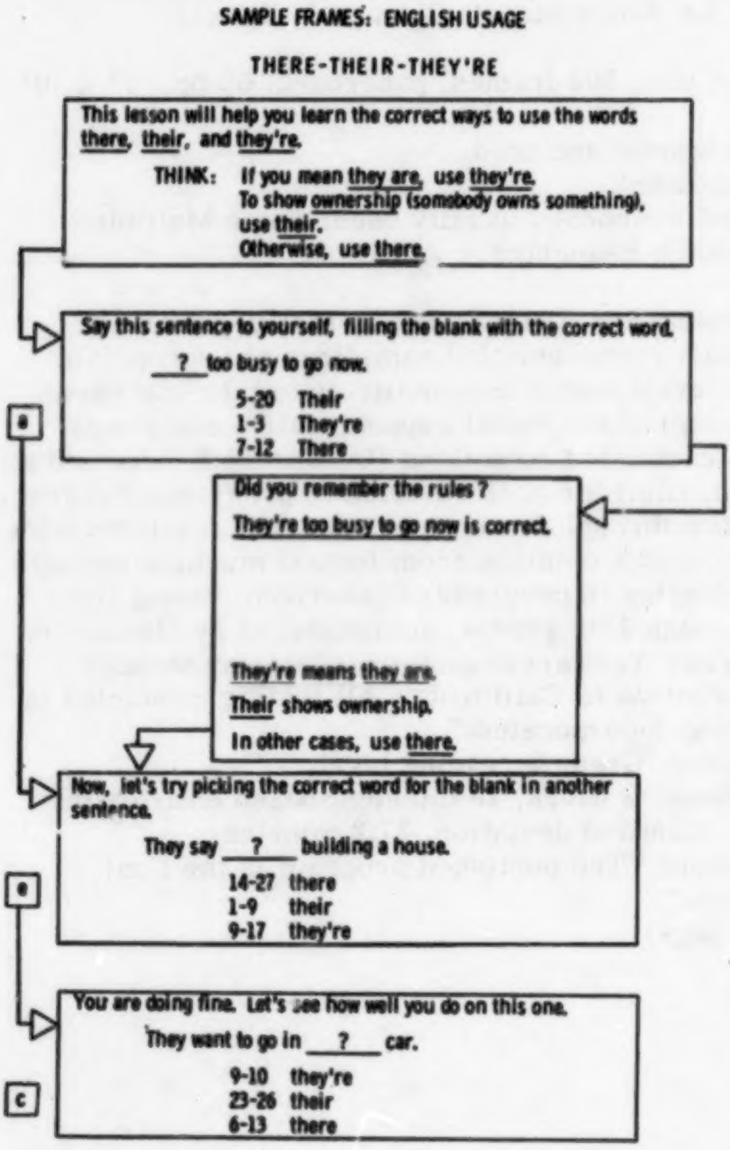
ENGLISH USAGE
THORWALD ESBENSEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)
Published by E-Z SORT SYSTEMS, LTD.,
45 Second Street, San Francisco, California

Programed text, 600 frames, paperback, 120 pp., 5" x 8", $7.85 (includes response device).
"Program fits response device consisting of 15 edge-punched cards—printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device—a sorter."
Teacher's Manual available, included with program.
Unit test(s) available, included in program.
Multiple Choice Responses usually used; some Constructed Responses; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Average third-grade class."
Prerequisites: "Ability to read at third grade level."
Additional material required: "Response device described above."
Average Time: 10 hours (est.).
Next Revision: "Unknown."
(1 sample page)

GRAMMAR & USAGE

ENGLISH USAGE
Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS, LTD.
one sample page:



SAMPLE FRAMES: ENGLISH USAGE

THERE-THEIR-THEY'RE

This lesson will help you learn the correct ways to use the words there, their, and they're.

THINK: If you mean they are, use they're.
To show ownership (somebody owns something), use their.
Otherwise, use there.

Say this sentence to yourself, filling the blank with the correct word.

___?___ too busy to go now.

5-20 Their
1-3 They're
7-12 There

Did you remember the rules?

They're too busy to go now is correct.

They're means they are.

Their shows ownership.

In other cases, use there.

Now, let's try picking the correct word for the blank in another sentence.

They say ___?___ building a house.

14-27 there
1-9 their
9-17 they're

You are doing fine. Let's see how well you do on this one.

They want to go in ___?___ car.

9-10 they're
23-26 their
6-13 there

FIGURES OF SPEECH
WINIFRED NEAL, Programer, Learning Incorporated
JOSEPH P. COLLIGNON, English Dept. Arcadia High School, Scottsdale, Arizona.
Published by CORONET INSTRUCTIONAL FILMS, 65 E. So. Water Street, Chicago 1, Illinois.

Programed text, 308 frames, paperback, 59 pp., 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used: some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "...Small representative samplings at appropriate grade levels tested informally on one-to-one basis with programer. Small representative samplings under controlled conditions (Dukane Redi-tutor using 35 mm. film) for each revision of program. Program has been through 8 complete revisions, each revision based on data obtained from formal machine testing. Field testing in progress: Classroom testing from 8th through 12th grades, administered by classroom teachers. Test areas distributed geographically from Florida to California. All testing conducted by Learning Incorporated."
Prerequisites: Grade 9 reading level.
Average Time: 2 hours, 19 minutes (based entirely on data); standard deviation, 27.2 minutes.
Next Revision: "The published program is the final revision."
(1 sample page)

FIGURES OF SPEECH
Neal, Collignon; CORONET INSTRUCTIONAL FILMS
one sample page:

Set 2
Basic Figures of Speech

2-1 Find the sentence that contains a figure of speech:
A) "There are ten stores in our town."
B) "She has [illegible] autiful flower garden."
C) "That gi[illegible] as delicate as a glass doll."
Sentence (?) .

C

•

2-2 Find the sentences that contain figures of speech:
A) "That dancer is as graceful as a snowflake."
B) "That dancer is like a snowflake."
C) "That dancer is beautiful and graceful."
Sentences (?) and (?) .

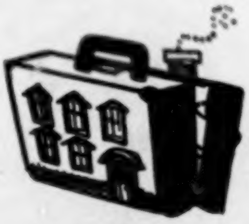
A; B (either order)

•

2-3 A) "That dancer is as graceful as a snowflake."
B) "That dancer is like a snowflake."
These figures of speech use the words like and as to describe a dancer by comparing her to a ____(?)____.

snowflake

•



2-4 A figure of speech that uses like or as in the comparison is called a simile.
A) "Our house is like an overstuffed suitcase."
B) "Our house is as cramped as an over-stuffed suitcase."
Each sentence contains a figure of speech called ____(?)____.

simile

Set 2 7

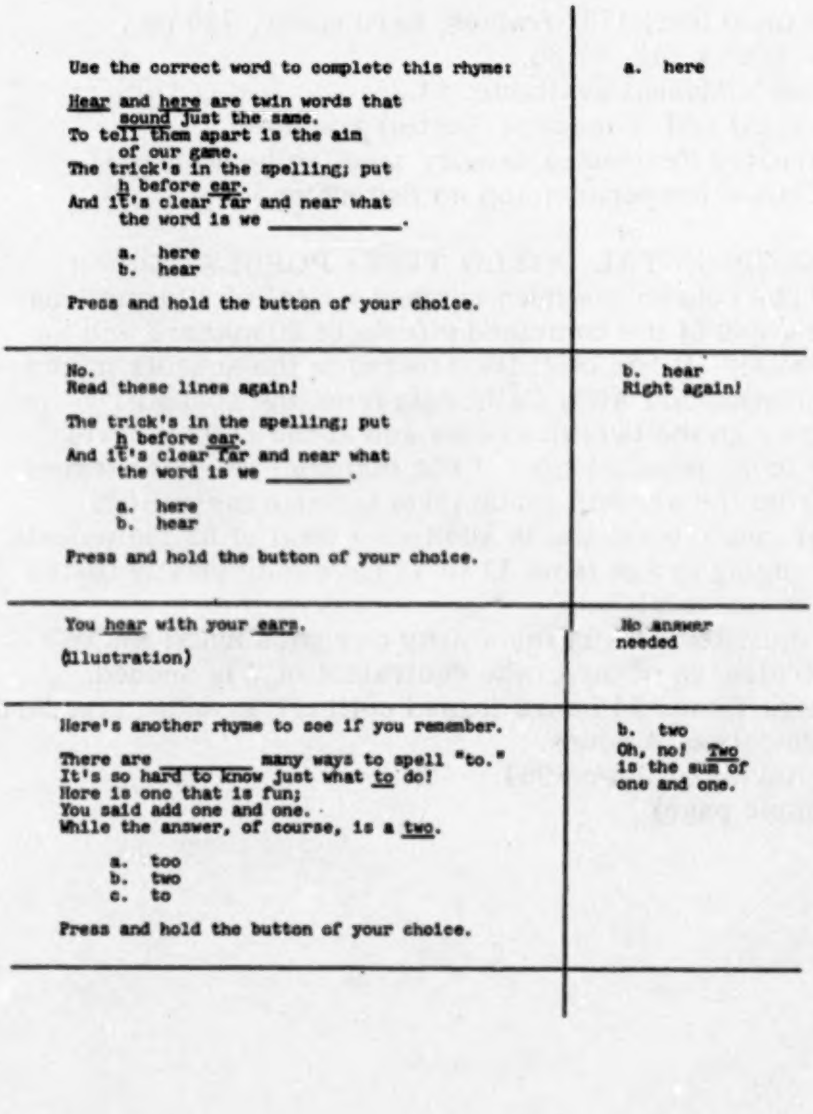
FUN WITH WORDS
Homonyms—Sound Alike Words
RUTH B. ROSENBERG, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use with HONOR TEACHING MACHINE, $20 (approx.) including 3 programs; program reusable, 200 frames; $2.00-$2.50.
Constructed Responses sometimes used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Public and private schools."
Prerequisites:
Average Time:
Next Revision:
(1 sample page)

GRAMMAR & USAGE

FUN WITH WORDS
Rosenberg; HONOR PRODUCTS COMPANY
one sample page:



Use the correct word to complete this rhyme: Hear and here are twin words that sound just the same. To tell them apart is the aim of our game. The trick's in the spelling; put h before ear. And it's clear far and near what the word is we ________. a. here b. hear Press and hold the button of your choice.	a. here
No. Read these lines again! The trick's in the spelling; put h before ear. And it's clear far and near what the word is we ______. a. here b. hear Press and hold the button of your choice.	b. hear Right again!
You hear with your ears. (Illustration)	No answer needed
Here's another rhyme to see if you remember. There are ________ many ways to spell "to." It's so hard to know just what to do! Here is one that is fun; You said add one and one. While the answer, of course, is a two. a. too b. two c. to Press and hold the button of your choice.	b. two Oh, no! Two is the sum of one and one.

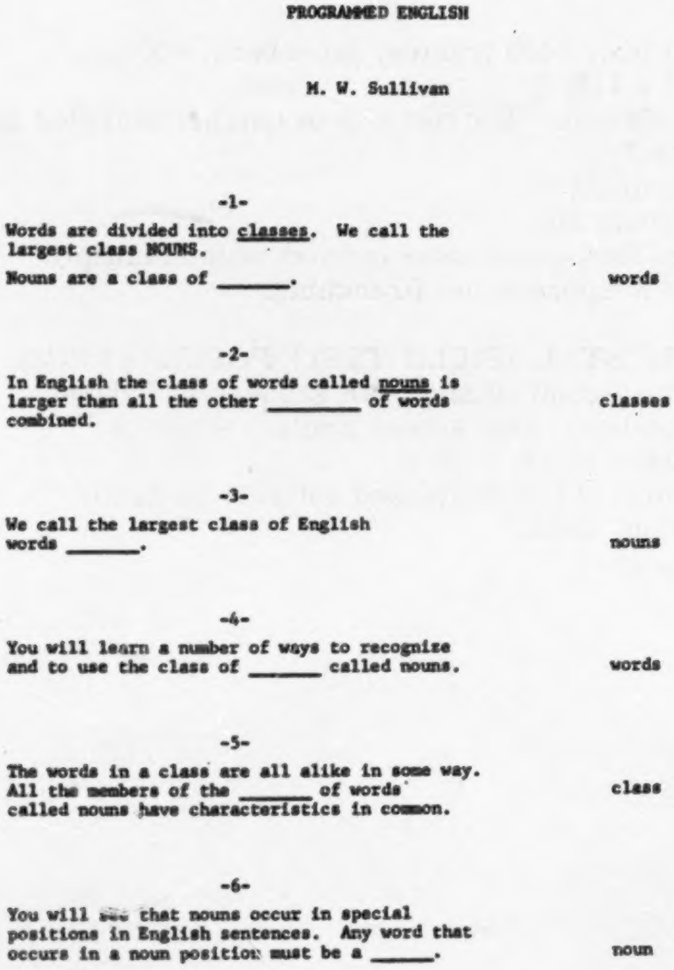
PROGRAMMED ENGLISH
A Modern Grammar for High School and College Students
M. W. SULLIVAN
Published by THE MACMILLAN COMPANY
60 Fifth Avenue, New York 11, New York

Programed text, 1782 frames, hard cover, 430 pp., 8-1/4" x 11", $7.80.
Teacher's Manual available, $1.25.
Unit, Final and Diagnostic Test(s) available.
Constructed Responses usually used; some Multiple Choice Responses; and no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "The course has been revised a total of 10 times making use of the combined efforts of 20 authors and critics. It has been field tested in the schools in and aro d Palo Alto, California from the seventh through the twelfth grades and at the college level."
Other using population(s): "The material has been tested from the seventh grade level through the college graduate level and in addition a total of 82 individuals ranging in age from 12 to 72 have individually tested the material."
Prerequisites: "Only the ability to read normal English sentences of the grade equivalent of 7 is needed."
Average Time: 24 hours (based entirely on data); standard deviation, 4 hours.
Next Revision: June 1964.
(1 sample page)

GRAMMAR & USAGE

PROGRAMMED ENGLISH
Sullivan; THE MACMILLAN COMPANY
one sample page:



PROGRAMMED ENGLISH

M. W. Sullivan

-1- Words are divided into classes. We call the largest class NOUNS. Nouns are a class of ______.	words
-2- In English the class of words called nouns is larger than all the other ______ of words combined.	classes
-3- We call the largest class of English words ______.	nouns
-4- You will learn a number of ways to recognize and to use the class of ______ called nouns.	words
-5- The words in a class are all alike in some way. All the members of the ______ of words called nouns have characteristics in common.	class
-6- You will see that nouns occur in special positions in English sentences. Any word that occurs in a noun position must be a ______.	noun

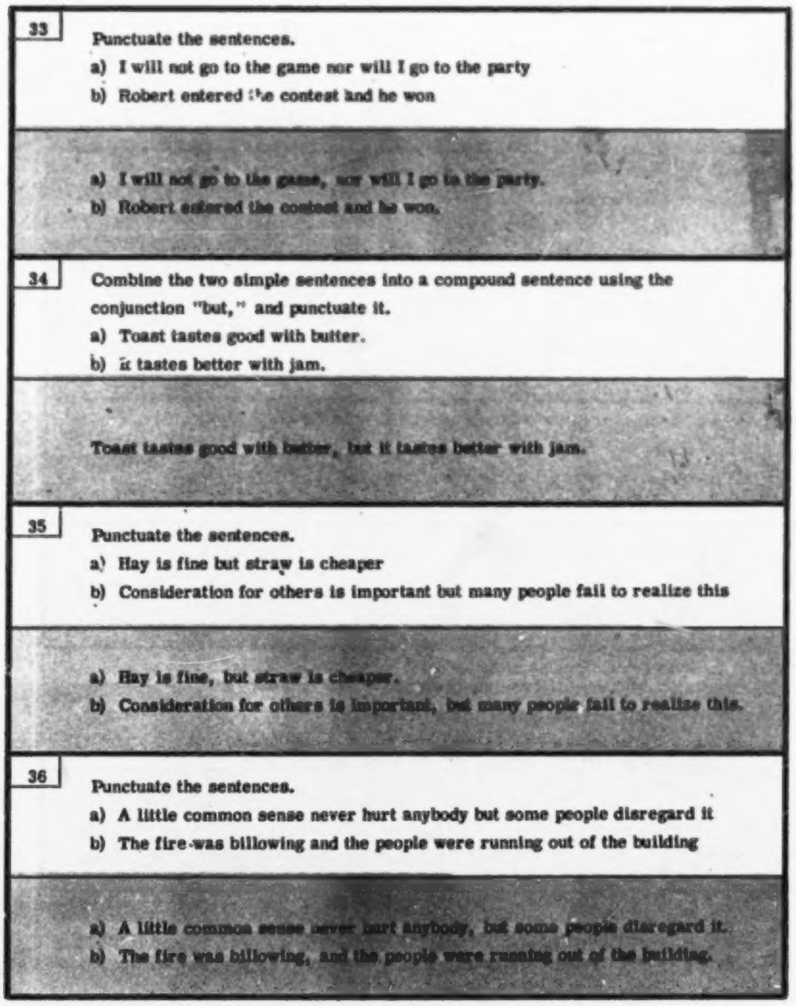
STRENGTHENING GRAMMATICAL CONCEPTS
FRANCES J. ZALENKA, Programer, GPTC
JEROME B. WHITE, Programer, GPTC
ANNE BEACH, Editor, GPTC
PAUL H. CARLSON, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 2400 frames, paperback, 600 pp., 8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: 8th graders and above. Field testing: High school English students."
Prerequisites: None.
Average Time: 24 hours (based entirely on data).
Next Revision: 1968.
(2 sample pages)

GRAMMAR & USAGE

STRENGTHENING GRAMMATICAL CONCEPTS
Zalenka, White, Beach, Carlson; ENCYCLOPAEDIA
BRITANNICA PRESS
2 sample pages:



33 Punctuate the sentences.

a) I will not go to the game nor will I go to the party
b) Robert entered the contest and he won

a) I will not go to the game, nor will I go to the party.
b) Robert entered the contest and he won.

34 Combine the two simple sentences into a compound sentence using the conjunction "but," and punctuate it.

a) Toast tastes good with butter.
b) It tastes better with jam.

Toast tastes good with butter, but it tastes better with jam.

35 Punctuate the sentences.

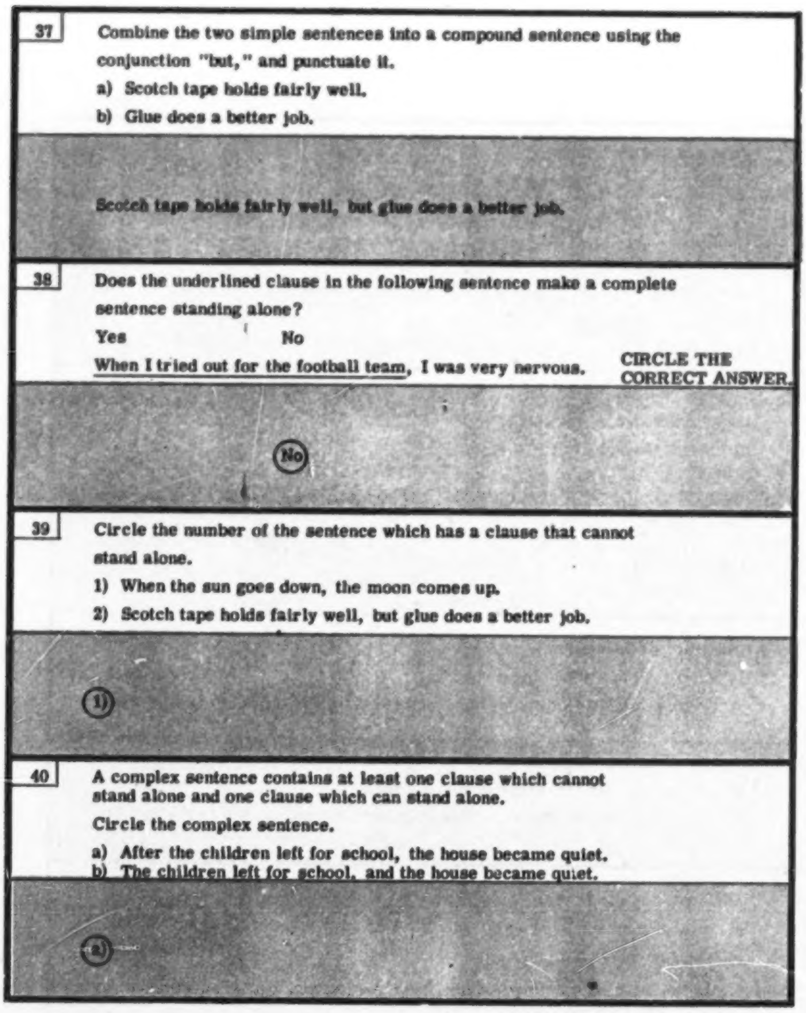
a) Hay is fine but straw is cheaper
b) Consideration for others is important but many people fail to realize this

a) Hay is fine, but straw is cheaper.
b) Consideration for others is important, but many people fail to realize this.

36 Punctuate the sentences.

a) A little common sense never hurt anybody but some people disregard it
b) The fire was billowing and the people were running out of the building

a) A little common sense never hurt anybody, but some people disregard it.
b) The fire was billowing, and the people were running out of the building.



37 Combine the two simple sentences into a compound sentence using the conjunction "but," and punctuate it.

a) Scotch tape holds fairly well.

b) Glue does a better job.

Scotch tape holds fairly well, but glue does a better job.

38 Does the underlined clause in the following sentence make a complete sentence standing alone?

Yes No

When I tried out for the football team, I was very nervous.

CIRCLE THE CORRECT ANSWER.

[✓ No]

39 Circle the number of the sentence which has a clause that cannot stand alone.

1) When the sun goes down, the moon comes up.

2) Scotch tape holds fairly well, but glue does a better job.

[✓ 1)]

40 A complex sentence contains at least one clause which cannot stand alone and one clause which can stand alone.

Circle the complex sentence.

a) After the children left for school, the house became quiet.

b) The children left for school, and the house became quiet.

[✓ a)]

STUDENTUTOR LIBRARY OF SENTENCES, WORDS, REFERENCES.
TECHNICAL STAFF, General Education, Inc.
Published by GENERAL EDUCATION, INC.,
96 Mount Auburn St., Cambridge 38, Mass.

For use in STUDENTUTOR, program reusable, 1500 frames, programs are supplied in a kit which contains 5 machines, 5 exhibit books, and 36 scrolls, $75.00.
Teacher's Manual available, free with kit.
Table of Contents.
Unit, Diagnostic Test(s) available. Pre and Post tests are interchangeable.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Pre and post tests used on 8-10 students per revision. Several revisions to achieve negligible error rates.
Average Time: 16 to 18 hours (est.).
Next Revision: "None planned as yet."
(2 sample pages)

GRAMMAR & USAGE

STUDENTUTOR LIBRARY OF SENTENCES, WORDS, REFERENCES

Technical Staff; GENERAL EDUCATION, INC.
2 sample pages:

Excerpt from

Section I: SENTENCES

Program 1: Understanding Sentences

5. **The man ate the fish.** **The fish ate the man.** Changing the order of words in a sentence can make . . . (a huge difference/no difference) in the meaning of a sentence.	a huge difference (especially if you were the man in this sentence.)
6. **Ate fish man the the.** Here are the same five words again. This time they are placed in alphabetical order. Without switching words around can you tell what this "sentence" means? . . . (Yes/No)	No
7. In order for us to understand a sentence, the words must be placed in a certain order. The words in any meaningful sentence are arranged . . . (in any order/in a very special order.)	in a very special order

Excerpt from

Section II: WORDS

Program 3: There, They're, Their

1. The single word "they're" stands for the two words "they are". The two words "they are" can be combined to form the single word "th____'re".	"they're"

2. When we combine the words "they are" to form the word "they're" we leave out one letter and insert an apostrophe (') in place of that letter. The letter that we leave out to form "they're" is the letter "____" (what letter?).	a
3. In forming "they're" from "they are" we omit the letter "a" and insert an apostrophe in its place between the letters "___" and "___".	y; r

Excerpt from

Section III: REFERENCES

Program 4: Page Numbers

5. **Herbert gobbled up bananas, pears and grapes.** This sentence means that Herbert ate . . . (a) bananas and pears. (b) bananas or pears.	(a) bananas and pears. (Are you wondering what this has to do with indexes?)
6. **Oscar loves licorice, fishing and girls.** A comma, then, is sometimes used instead of the word "______."	and
12. **Ice cream, 29, 33** This index entry means that the subject ice cream is discussed on pages	29 and 33 (Do you see now what Herbert's bananas and pears have to do with indexes?)

GRAMMAR & USAGE Sixth Grade

SYNONYMS, ANTONYMS, HOMONYMS

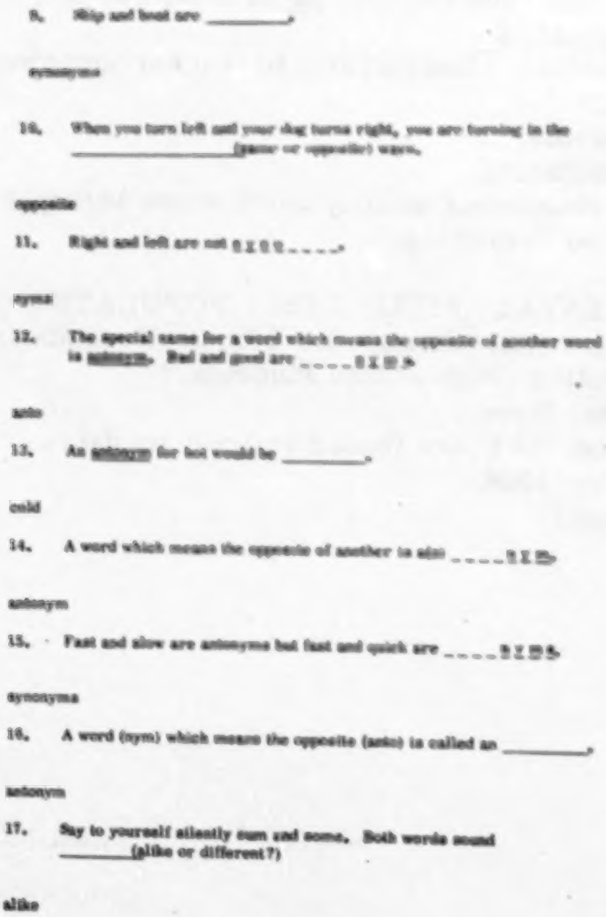
MARTA ZABORSKA, Programer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 34 frames, $.15.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL POPULATION(S): Grades 5, 6.
Prerequisites: "Grade 6 reading level."
Average Time: 12.8 minutes (based entirely on data); standard deviation, 3.8 minutes.
Next Revision: "The program is the final revision."
(1 sample page)

GRAMMAR & USAGE

SYNONYMS, ANTONYMS, HOMONYMS
Zaborska; LEARNING INCORPORATED
one sample page:



9. Ship and boat are ________.

synonyms

10. When you turn left and your dog turns right, you are turning in the ________________(same or opposite?) ways.

opposite

11. Right and left are not s y n o _____.

nyms

12. The special name for a word which means the opposite of another word is antonym. Bad and good are ____ n y m s.

anto

13. An antonym for hot would be ________.

cold

14. A word which means the opposite of another is also ____ n y m.

antonym

15. Fast and slow are antonyms but fast and quick are ____ n y m s.

synonyms

16. A word (nym) which means the opposite (anto) is called an ________.

antonym

17. Say to yourself silently sum and some. Both words sound ________(alike or different?)

alike

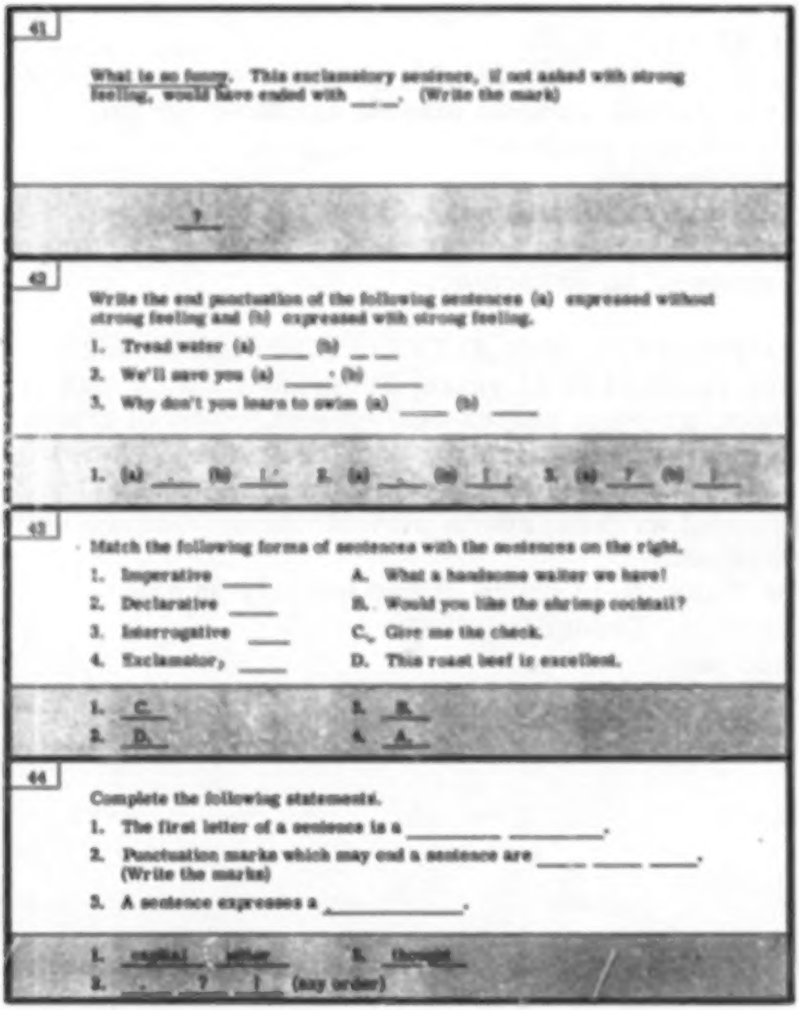
ACHIEVING CLARITY THROUGH PUNCTUATION
ANNE BEACH, Editor, GPTC
ROBERT A. FAWVER, Programer, GPTC
WILLIE Y. HUFF, Programer, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1800 frames, paperback, 300 pp., 8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: 8th-10th grade students. Field testing: High school students."
Prerequisites: None.
Average Time: 18 hours (based entirely on data).
Next Revision: 1968.
(1 sample page)

GRAMMAR & USAGE

ACHIEVING CLARITY THROUGH PUNCTUATION
Beach, Fawver, Huff; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



41

What is so funny. This exclamatory sentence, if not asked with strong feeling, would have ended with ___. (Write the mark)

?

42

Write the end punctuation of the following sentences (a) expressed without strong feeling and (b) expressed with strong feeling.

1. Tread water (a) ____ (b) ____
2. We'll save you (a) ____ (b) ____
3. Why don't you learn to swim (a) ____ (b) ____

1. (a) . (b) ! 2. (a) . (b) ! 3. (a) ? (b) !

43

Match the following forms of sentences with the sentences on the right.

1. Imperative ____	A. What a handsome waiter we have!
2. Declarative ____	B. Would you like the shrimp cocktail?
3. Interrogative ____	C. Give me the check.
4. Exclamatory ____	D. This roast beef is excellent.

1. C
2. D
3. B
4. A

44

Complete the following statements.

1. The first letter of a sentence is a ________ ________.
2. Punctuation marks which may end a sentence are ____ ____ ____. (Write the marks)
3. A sentence expresses a ____________.

1. capital letter
2. . ? ! (any order)
3. thought

GRAMMAR AND USAGE Jr. H.S.+

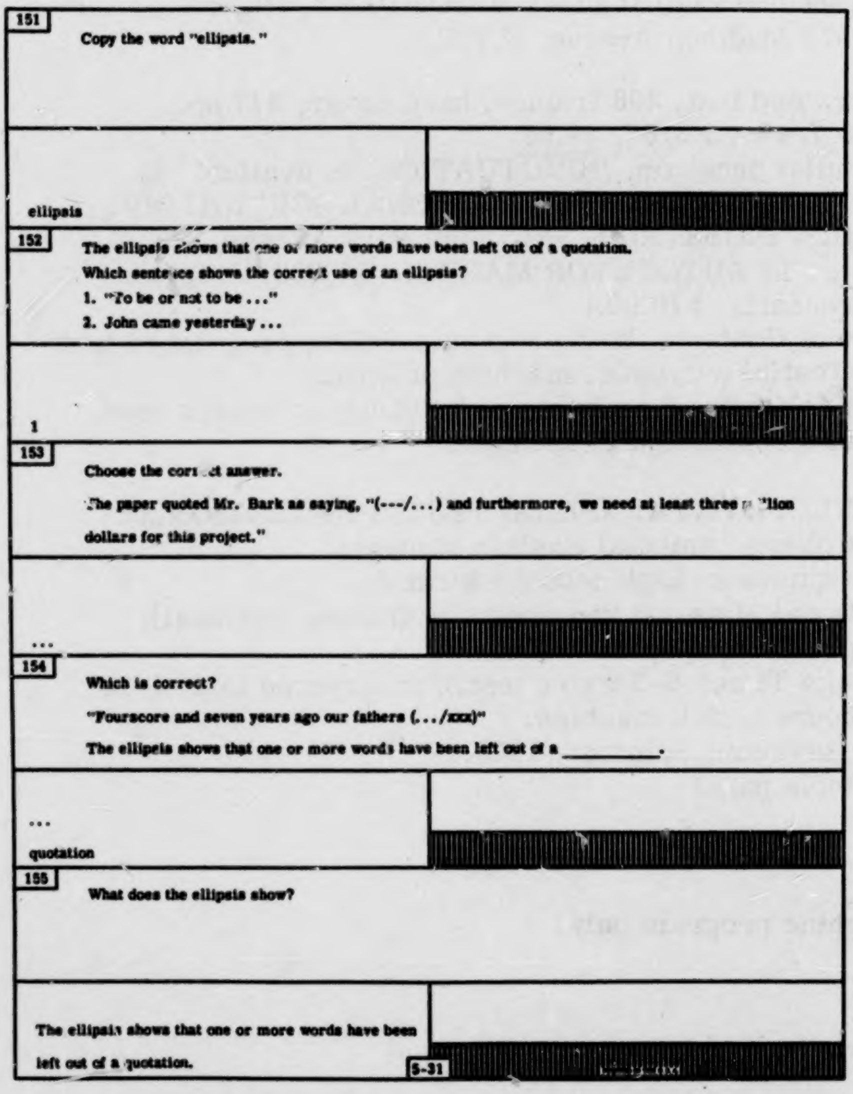
MODERN ENGLISH SERIES: PUNCTUATION
LLOYD E. HOMME
POLO C. DE BACA, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York

Programed text, 1,178 frames, paperback, 272 pp.,
8 1/2" x 11", $8.50.
For use in MIN/MAX II, $25.00; program reusable, $7.50.
Teacher's Manual: General Manual available for all
TMI-Grolier programs.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses always used; no Multiple Choice
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Age range 12 to 21 years, 7th grade through high school, average age of 14.7. Average school grade: 4th month of 9th year."
Other using population(s): "Review for college students, technical writers, adults performing secretarial duties."
Prerequisites:
Average Time: 8-12 hours (based entirely on data).
Next Revision: December, 1963.
(1 sample page)

GRAMMAR & USAGE

MODERN ENGLISH SERIES: PUNCTUATION
Homme, De Baca; TEACHING MATERIALS CORPORATION
one sample page:



151

Copy the word "ellipsis."

ellipsis

152

The ellipsis shows that one or more words have been left out of a quotation.

Which sentence shows the correct use of an ellipsis?

1. "To be or not to be . . ."
2. John came yesterday . . .

1

153

Choose the correct answer.

The paper quoted Mr. Bark as saying, "(---/. . .) and furthermore, we need at least three million dollars for this project."

. . .

154

Which is correct?

"Fourscore and seven years ago our fathers (. . ./xxx)"

The ellipsis shows that one or more words have been left out of a __________.

. . .

quotation

155

What does the ellipsis show?

The ellipsis shows that one or more words have been left out of a quotation.

5-31

PROPER PUNCTUATION
KELLOGG SMITH
LEIGHTON STEELE
* ADRIENNE ZAHNISER, all of U.S.I. Educational Science Division.
Published by DOUBLEDAY & COMPANY, INC.,
575 Madison Avenue, N.Y.C.

Programed text, 266 frames, hard cover, 277 pp., 8 1/4" x 5 3/8", $4.95.
(A similar program, PUNCTUATION, is available in TM format from: EDUCATIONAL SCIENCE DIV., U.S. INDUSTRIES, INC., 250 Park Avenue, N.Y.C.
For use IN AUTOTUTOR MARK II. $1,250; Program reusable, $70.00.)
Table of Contents, both programs; Index, programed text.
Unit Test(s) available, machine program.
Multiple Choice Responses and Branching always used, no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): College remedial English students.
Prerequisites: High school education.
Additional Material required: Dictionary (optional), pencil and paper.
Average Time: 5-7 hours (est.), programed text; 4-10 hours (est.), machine.
Next Revision: Summer, 1963.
(1 sample page)

* Machine program only.

PROPER PUNCTUATION

Smith, Steele, Zahniser; DOUBLEDAY & COMPANY
one sample page:

Sample from Proper Punctuation

87
(from page 92)

YOUR ANSWER: The colon may be used only after a complete statement.

Right.

This is a carry-over from the older use of the colon to separate the independent elements of sentences. You should write

> **I bought a box of crayons, some paper, and a stencil-cutter.**

because I bought is not a complete statement. If you want to introduce the series with a colon, you should write

> **I bought the following items: a box of crayons, some paper, and a stencil-cutter.**

for I bought the following items is a complete statement, and can stand by itself.

Which of the following sentences is incorrectly punctuated?

I chose: the red, the blue, the green, and the mauve. **page 74**

What is the cause of your failure: sloth or neurosis? **page 76**

Again, nothing is asserted: no belief, no truth, no philosophy. **page 78**

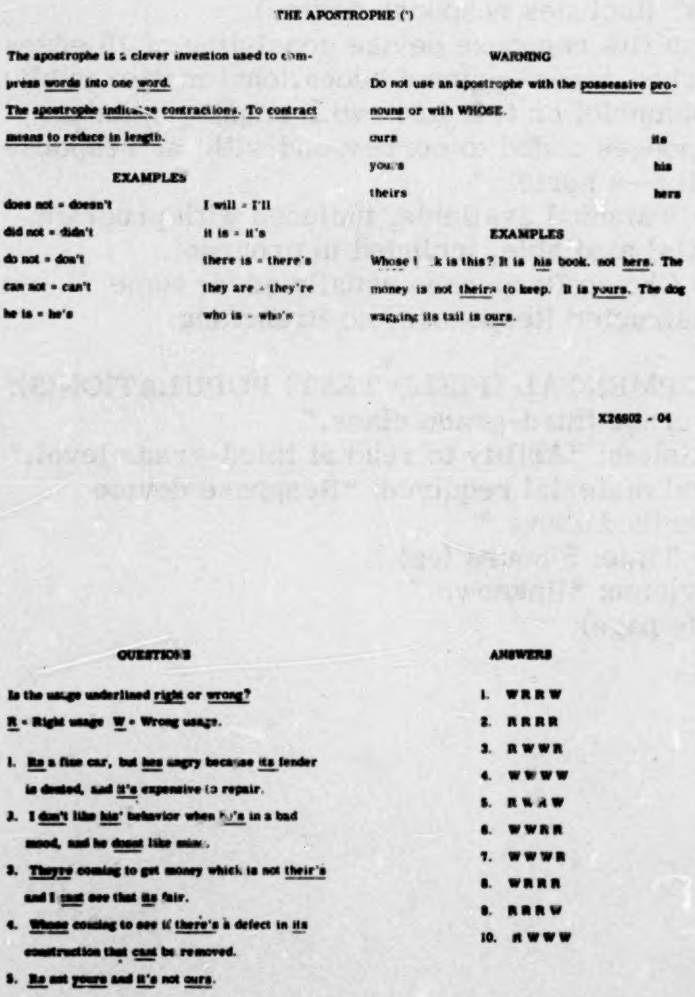
PUNCTUATION & CAPITALIZATION 26
GEORGE M. SNYDER, Programer
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 3240 frames, paperback, 108 pp.,
5" x 7", available in 3 separate units at $3.75 each.
For use in SPEED machine, program reusable, $30.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED machine, $700 &
$850.
Average Time: 5 hours (est.).
Next Revision:
(1 sample page)

GRAMMAR & USAGE

PUNCTUATION & CAPITALIZATION 26
Snyder; EDUCATION ENGINEERING
one sample page:



THE APOSTROPHE (')

The apostrophe is a clever invention used to compress words into one word.

The apostrophe indicates contractions. To contract means to reduce in length.

EXAMPLES

does not = doesn't
did not = didn't
do not = don't
can not = can't
he is = he's

I will = I'll
it is = it's
there is = there's
they are = they're
who is = who's

WARNING

Do not use an apostrophe with the possessive pronouns or with WHOSE.

ours   its
yours   his
theirs   hers

EXAMPLES

Whose book is this? It is his book. not hers. The money is not theirs to keep. It is yours. The dog wagging its tail is ours.

X26802 - 04

QUESTIONS

Is the usage underlined right or wrong?
R = Right usage W = Wrong usage.

1. Its a fine car, but hes angry because its fender is dented, and it's expensive to repair.
2. I don't like his' behavior when he's in a bad mood, and he doesnt like mine.
3. Theyre coming to get money which is not their's and I cant see that its fair.
4. Whose coming to see if there's a defect in its construction that cant be removed.
5. Its not yours and it's not ours.

ANSWERS

1. W R R W
2. R R R R
3. R W W R
4. W W W W
5. R W R W
6. W W R R
7. W W W R
8. W R R R
9. R R R W
10. R W W W

USING CAPITAL LETTERS
THORWALD ESBENSEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)
Published by E-Z SORT SYSTEMS, LTD.,
45 Second Street, San Francisco, California

Programed text, 300 frames, paperback, 70 pp., 5" x 8", $6.45 (includes response device).
"Program fits response device consisting of 15 edge-punched cards—printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device—a sorter."
Teacher's Manual available, included with program.
Unit test(s) available, included in program.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

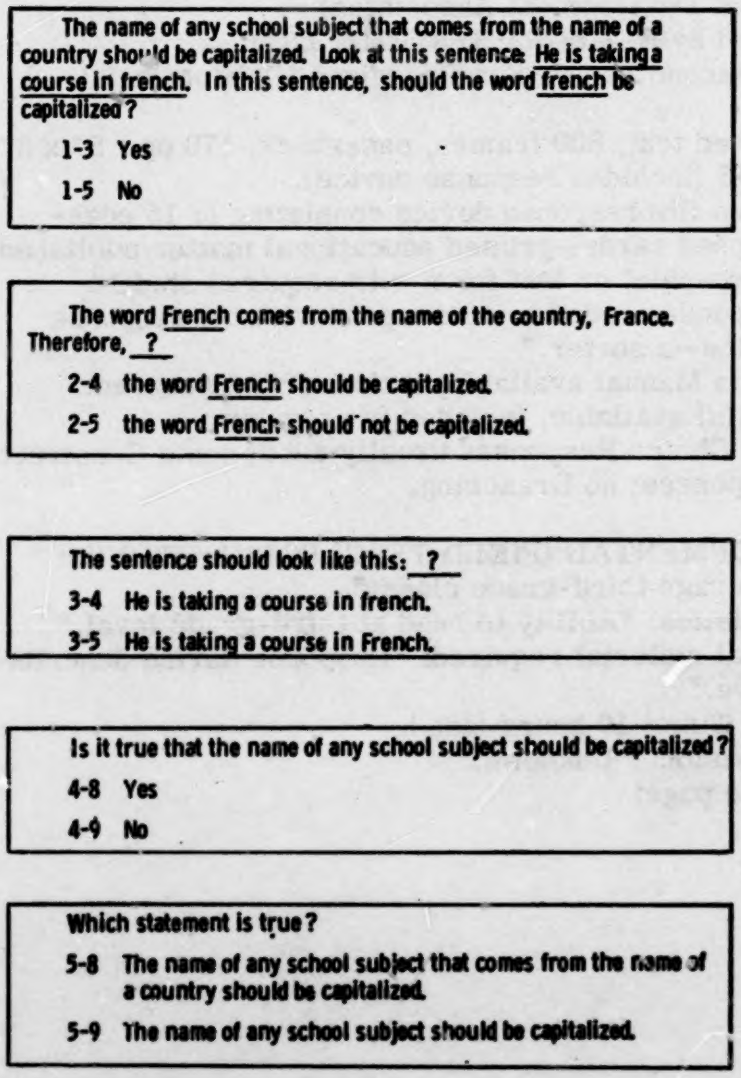
DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Average third-grade class."
Prerequisites: "Ability to read at third-grade level."
Additional material required: "Response device described above."
Average Time: 5 hours (est.).
Next Revision: "Unknown."
(1 sample page)

GRAMMAR & USAGE

USING CAPITAL LETTERS

Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS, LTD.

one sample page:



The name of any school subject that comes from the name of a country should be capitalized. Look at this sentence: He is taking a course in french. In this sentence, should the word french be capitalized?

1-3 Yes

1-5 No

The word French comes from the name of the country, France. Therefore, _?_

2-4 the word French should be capitalized.

2-5 the word French should not be capitalized.

The sentence should look like this: _?_

3-4 He is taking a course in french.

3-5 He is taking a course in French.

Is it true that the name of any school subject should be capitalized?

4-8 Yes

4-9 No

Which statement is true?

5-8 The name of any school subject that comes from the name of a country should be capitalized.

5-9 The name of any school subject should be capitalized.

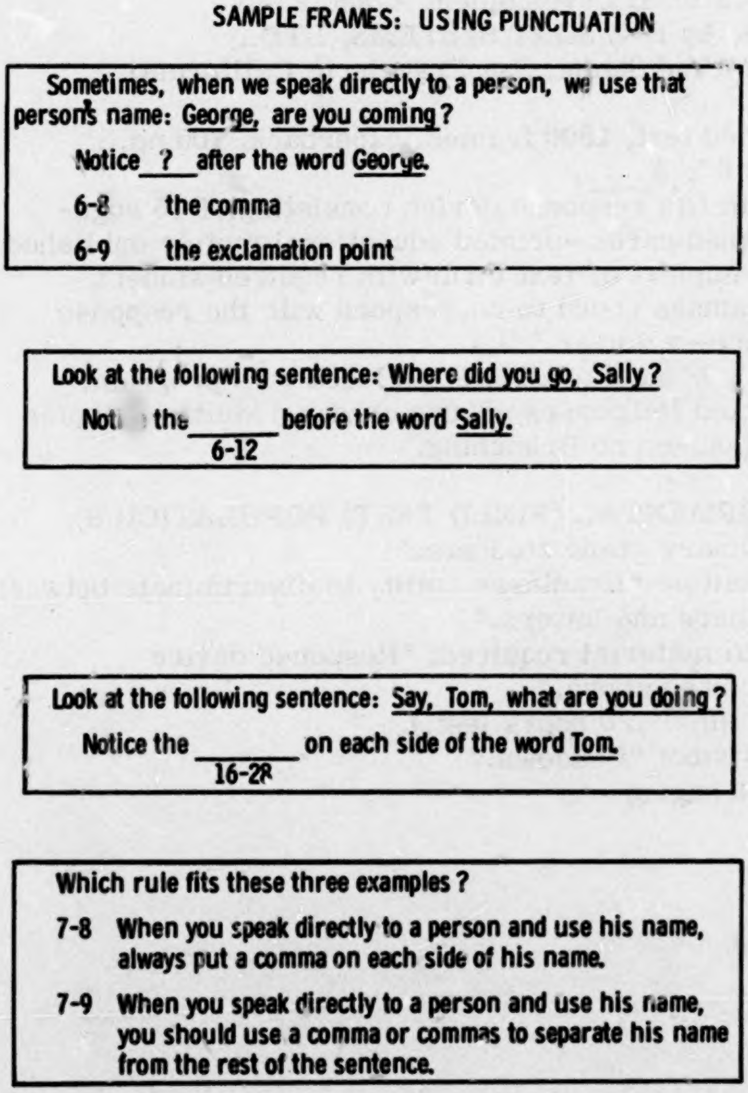
USING PUNCTUATION
THORWALD ESBENSEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)
Published by E-Z SORT SYSTEMS, LTD., 45 Second Street, San Francisco, California

Programed text, 600 frames, paperback, 170 pp., 5" x 8", $7.85 (includes response device).
"Program fits response device consisting of 15 edge-punched cards—printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device—a sorter."
Teacher's Manual available, included with program.
Unit test(s) available, included in program.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Average third-grade class."
Prerequisites: "Ability to read at third-grade level."
Additional material required: "Response device described above."
Average Time: 10 hours (est.).
Next Revision: "Unknown."
(1 sample page)

GRAMMAR & USAGE

USING PUNCTUATION
Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS, LTD.
one sample page:



SAMPLE FRAMES: USING PUNCTUATION

Sometimes, when we speak directly to a person, we use that person's name: George, are you coming?

Notice ___?___ after the word George.

6-8 the comma

6-9 the exclamation point

Look at the following sentence: Where did you go, Sally?

Notice the ______ before the word Sally.
6-12

Look at the following sentence: Say, Tom, what are you doing?

Notice the ______ on each side of the word Tom.
16-28

Which rule fits these three examples?

7-8 When you speak directly to a person and use his name, always put a comma on each side of his name.

7-9 When you speak directly to a person and use his name, you should use a comma or commas to separate his name from the rest of the sentence.

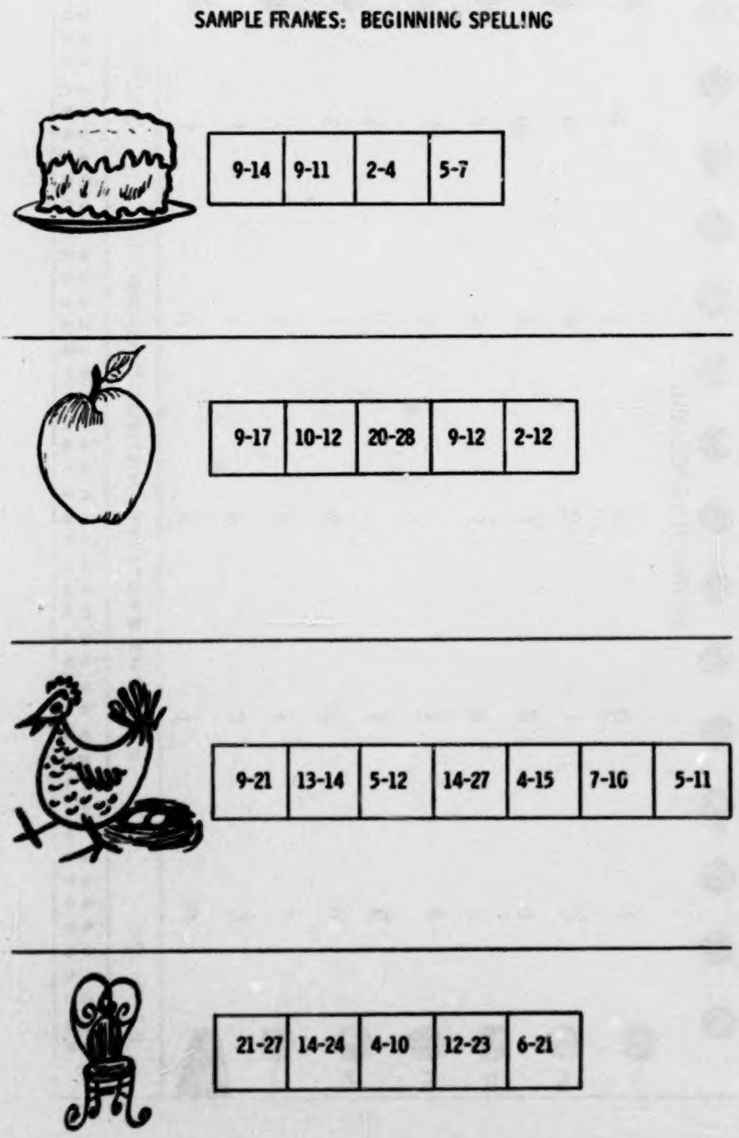
BEGINNING SPELLING
THORWALD ESBENSEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)
Published by E-Z SORT SYSTEMS, LTD.,
45 Second Street, San Francisco, California.

Programed text, 1500 frames, paperback, 105 pp., 5" x 8", $____.
"Program fits response device consisting of 15 edge-punched cards—printed educational matter published in pamphlet or text form with required student responses coded to correspond with the response device—a sorter."
Teacher's Manual available, included with program.
Constructed Responses always used; no Multiple Choice Responses, no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Primary grade students."
Prerequisites: "Readiness ability to discriminate between numbers and letters."
Additional material required: "Response device described above."
Average time: 120 hours (est.).
Next Revision: "Unknown."
(2 sample pages)

GRAMMAR & USAGE

BEGINNING SPELLING
Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS, LTD.
2 sample pages:



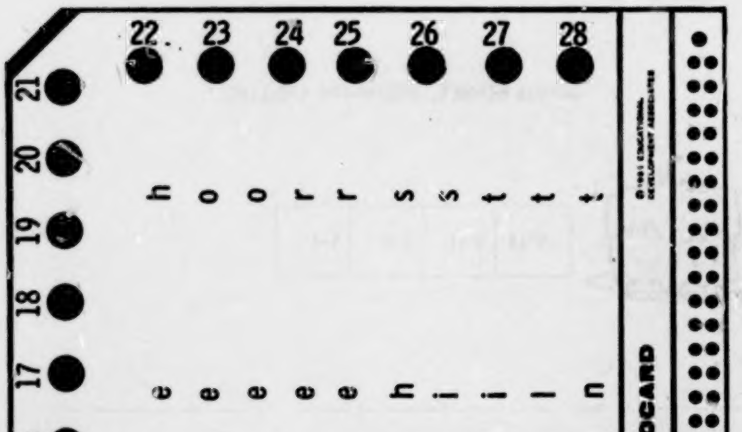
SAMPLE FRAMES: BEGINNING SPELLING

9-14	9-11	2-4	5-7

9-17	10-12	20-28	9-12	2-12

9-21	13-14	5-12	14-27	4-15	7-10	5-11

21-27	14-24	4-10	12-23	6-21


BEGINNING SPELLING
E-Z SORT SYSTEMS INSTRUCTOCARD
1
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t k e v a p h x b m
g l d q z s n y c j
o u f i r w a a a
e e e e e h i i l n
h o o r r s s t t t

SAMPLE MASTER CARD E-Z SORT INSTRUCTOCARD TWIN-T

IMPROVING YOUR SPELLING
SHIRLEY B. BITTERLICH, Programer, GPTC
ROBERT K. BRANSON, Editor, GPTC
PAUL H. CARLSON, Programer, GPTC
WILLIE Y. HUFF, Programer, General Programmed Teaching Corporation.
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 2106 frames, paperback, 351 pp., 8-1/2" x 11", $_____.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

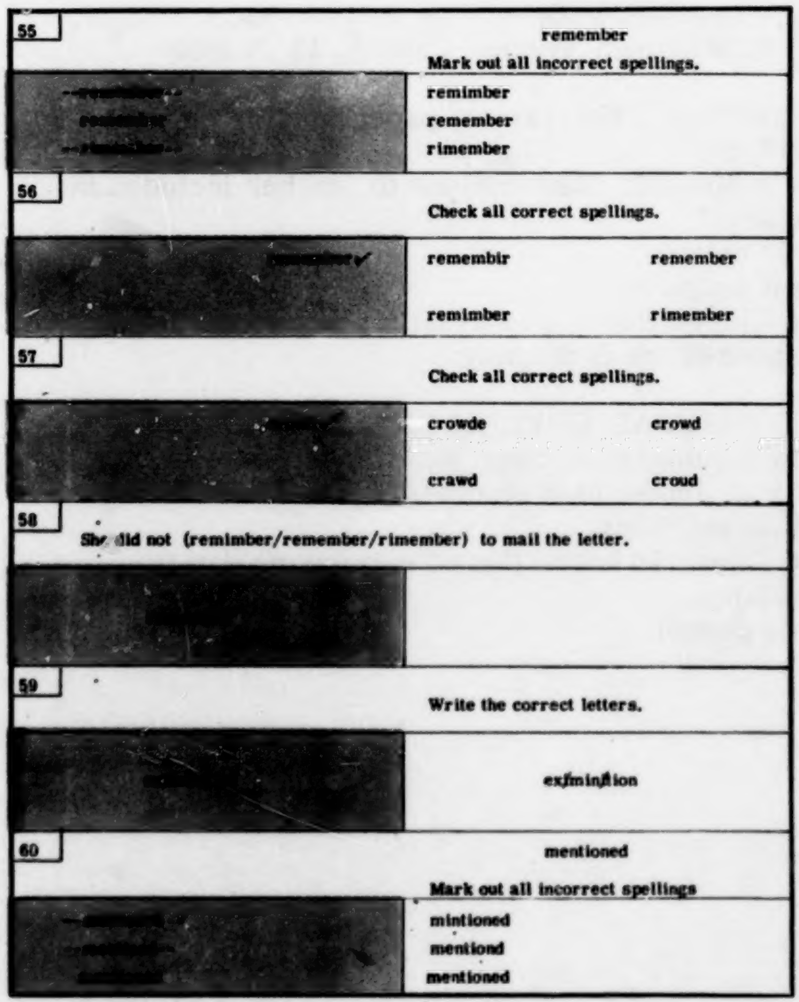
DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: 8th-11th graders. Field testing: Junior high students."
Prerequisites: None.
Average Time: 10 hours (based entirely on data).
Next Revision:
(2 sample pages)

GRAMMAR & USAGE

IMPROVING YOUR SPELLING

Bitterlich, Branson, Carlson, Huff; ENCYCLOPAEDIA BRITANNICA PRESS

2 sample pages:



55

remember

Mark out all incorrect spellings.

[redacted]

reminber

remember

rimember

56

Check all correct spellings.

[redacted]

remembir remember

reminber rimember

57

Check all correct spellings.

[redacted]

crowde crowd

crawd croud

58

She did not (reminber/remember/rimember) to mail the letter.

[redacted]

59

Write the correct letters.

[redacted]

ex/min/ion

60

mentioned

Mark out all incorrect spellings

[redacted]

mintioned

mentiond

mentioned

61

Write the correct letter.

mentioned

m/ntioned

62

Underline all correct spellings.

examination

examinition examanation

examination eximanation

63

Mark out all incorrect letters
and write the correct spelling.

[illegible] crowd

croude ____________

64

Write the correct letters.

remember

r/m/mb/r

65

The speaker (mentioned/menshuned/menteoned) the international situation.

mentioned

66

Mark out all misspellings.

[illegible]

examination examination

evalueate evaluate

knowledge nowledge

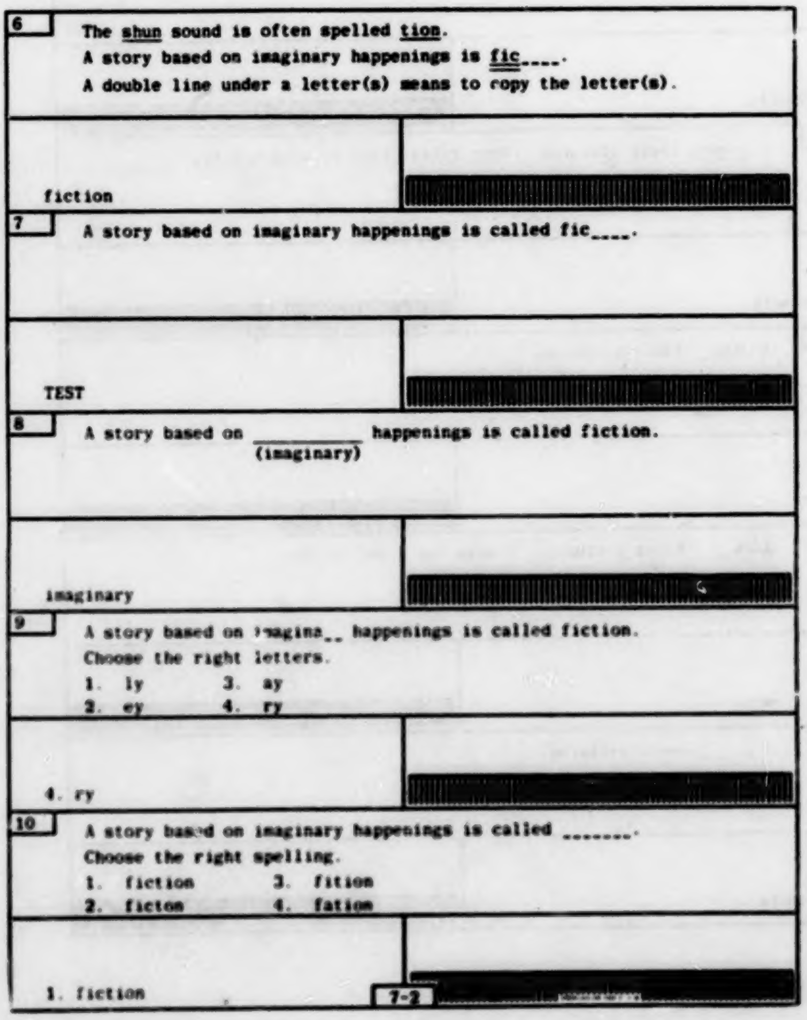
MODERN ENGLISH SERIES: SPELLING RULES
LLOYD E. HOMME
DONALD T. TOSTI, both of Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York

Programed text, 2,990 frames, paperback, 612 pp., 8 1/2" x 11", bound in 3 separate volumes, $13.50.
For use in MIN/MAX II machine, $25.00; program reusable, $12.50.
Teacher's Manual: General Manual for all TMI-Grolier programs available.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "8 year olds in 4th month of 3rd grade with average IQ of 107."
Prerequisites: "Third grade reading skill."
Average Time: 12-24 hours (based entirely on data); standard deviation, 4.2 hours.
Next Revision: June, 1963.
(3 sample pages)

GRAMMAR & USAGE

MODERN ENGLISH SERIES: SPELLING RULES
Homme, Tosti; TEACHING MATERIALS CORPORATION
3 sample pages:



6
The shun sound is often spelled tion.
A story based on imaginary happenings is fic____.
A double line under a letter(s) means to copy the letter(s).

fiction

7
A story based on imaginary happenings is called fic____.

TEST

8
A story based on __________ happenings is called fiction.
(imaginary)

imaginary

9
A story based on imagina__ happenings is called fiction.
Choose the right letters.
1. ly 3. ay
2. ey 4. ry

4. ry

10
A story based on imaginary happenings is called _______.
Choose the right spelling.
1. fiction 3. fition
2. ficton 4. fation

1. fiction

7-2

116 ------- means shy.

Bashful

117 A camera takes pictures. John takes pictures with his new ------.

camera

118 A came-- takes pictures.

ra

119 A ca---- takes pictures. Choose the right letters.

1. mrea
2. mera

2. mera

120 A ------ takes pictures.

camera

9-24

31 When a line is placed over a vowel, it shows that it has the ________ vowel sound.

long

32 The word bring comes ________ the word bottle in the dictionary.

TEST

33 When you add ed to ________, you get flapped.

flap

34 Prehaps means maybe. Find the misspelled word and spell it correctly. ________

Perhaps

35 When words have the same letter at the beginning, like job and jump, they are put in the order of their ________ letter.

second

11-7

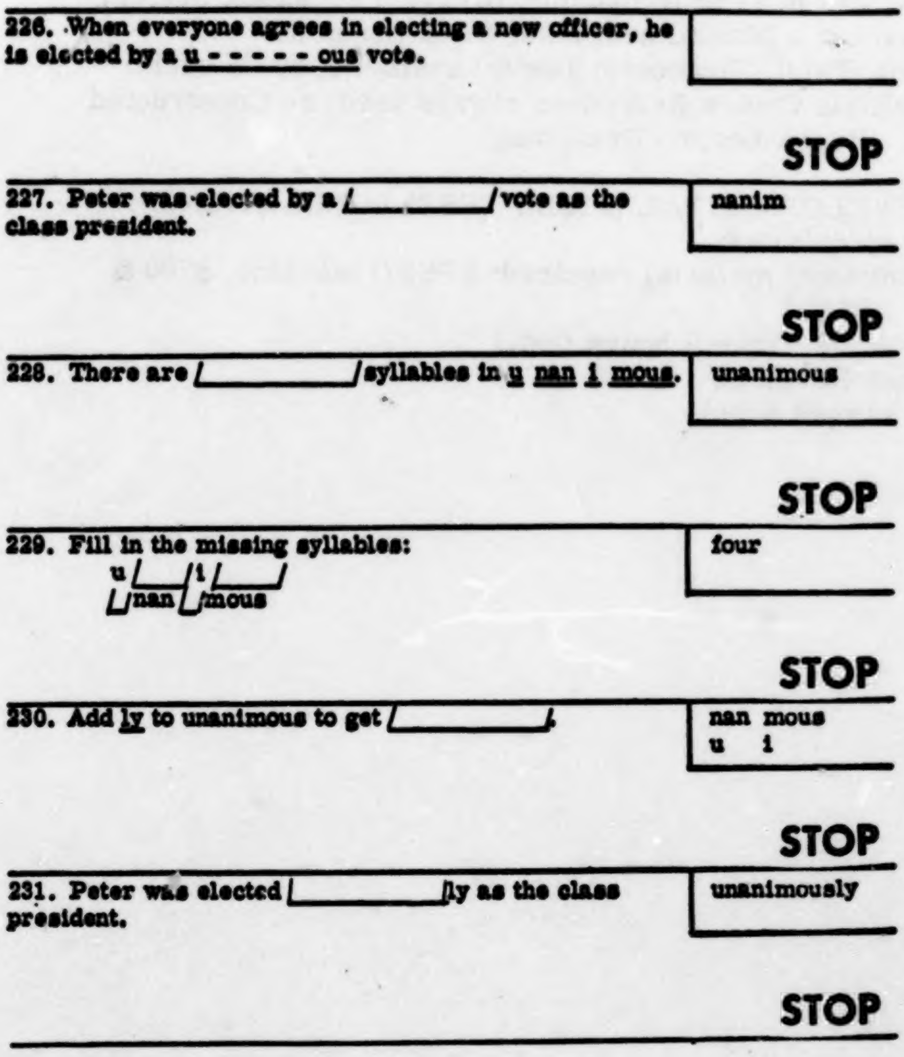
SPELLING DEMONS, I and II
EMANUEL BIERMAN, programer, assistant principal, Queens, N. Y.
ALEXANDER SCHURE, President, N. Y. Institute of Technology
Published by CENTRAL SCIENTIFIC Company, 1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95; program not reusable, 500 frames in I, 500 in II, I or II included in price of machine.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Over 200."
Prerequisites: None
Average Time: 3 hours (est.).
Next Revision: "Now available."
(1 sample page)

GRAMMAR & USAGE

SPELLING DEMONS, I and II
Bierman, Schure; CENTRAL SCIENTIFIC
one sample page:



226. When everyone agrees in electing a new officer, he is elected by a u - - - - - ous vote.	
	STOP
227. Peter was elected by a /__________/ vote as the class president.	**nanim**
	STOP
228. There are /__________/ syllables in u nan i mous.	**unanimous**
	STOP
229. Fill in the missing syllables: **u /____/ i /____/** **/_/ nan /_/ mous**	**four**
	STOP
230. Add ly to unanimous to get /__________/.	**nan mous** **u i**
	STOP
231. Peter was elected /__________/ ly as the class president.	**unanimously**
	STOP

GRAMMAR & USAGE

SPELLING IMPROVEMENT 18
GEORGE M. SNYDER, Programer
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 6480 frames, paperback, 216 pp.,
5" x 7", available in 6 separate units at $3.75 each.
For use in SPEED machine, program reusable, $60.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED machine, $700 &
$850.
Average Time: 8 hours (est.).
Next Revision:
(1 sample page)

GRAMMAR & USAGE

SPELLING IMPROVEMENT 18
Snyder; EDUCATION ENGINEERING
one sample page:

SPELLING DEMONS II

29. ____________ are words that mean the same or have the same definition.

. . . .

Synonyms

30. A synonym of resident is ________.

. . . .

inhabitant

31. To break into someone's conversation is to __________ the conversation.

. . . .

interrupt

32. You will interr--- the speaker is you ask a question while he is speaking.

. . . .

upt

33. It is impolite to in___upt a conversation.

terr

SPELLING U-3007
UNIVERSAL ELECTRONICS LABORATORIES CORPORATION
Published by UNIVERSAL TEACHING MACHINE INSTITUTE,
510 Hudson Street, Hackensack, New Jersey.

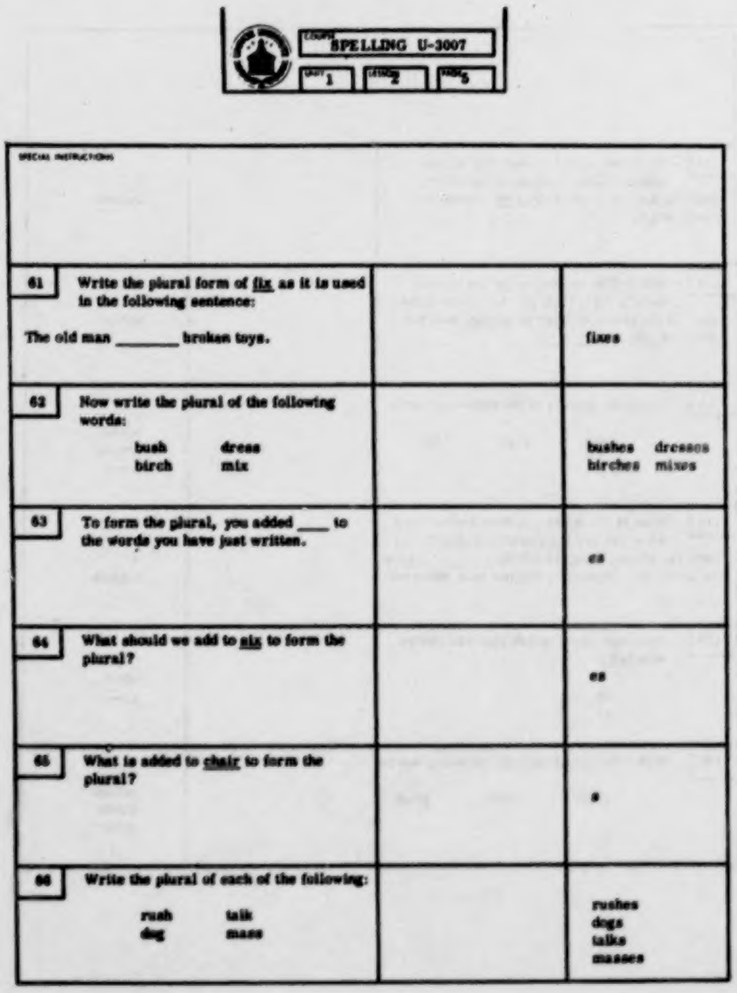
For use in UNIVERSAL MODEL U machine, program reusable, 2160 frames, machine and program, $25.00 (school discount).
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Grade level - 2-6."
Other using population(s): "Jr. High school students, high school students and adults."
Prerequisites: None.
Average Time: 24 to 28 hours (est.).
Next Revision: August, 1963.
(2 sample pages)

GRAMMAR & USAGE

SPELLING U-3007

Universal Electronics Laboratories Corporation;
UNIVERSAL TEACHING MACHINE INSTITUTE
2 sample pages:



SPELLING U-3007

1 2 5

SPECIAL INSTRUCTIONS

61 Write the plural form of fix as it is used in the following sentence: The old man _______ broken toys.		fixes
62 Now write the plural of the following words: bush dress birch mix		bushes dresses birches mixes
63 To form the plural, you added ____ to the words you have just written.		es
64 What should we add to six to form the plural?		es
65 What is added to chair to form the plural?		s
66 Write the plural of each of the following: rush talk dog mass		rushes dogs talks masses

SPELLING U-3007

1 4 2

115 Since you hear a v when you say the plural of leaf, it must be formed by changing the f to v and adding es. Write the plural of leaf.		leaves
116 Words that end in f or fe and rhyme usually form their plurals in the same way. If the plural of knife is knives, then the plural of wife is ________.		wives
117 Write the plurals of the following words: wife knife life		wives knives lives
118 What is the letter you hear before the s when you say the plural of belief? You form the plural, then, by adding ________, as in the sentence: Different religions have different ________.		f s beliefs
119 Form two other words that will rhyme with belief. ch _ _ _ gr _ _ _		chief grief
120 Write the plurals for the following words: belief chief grief		beliefs chiefs griefs

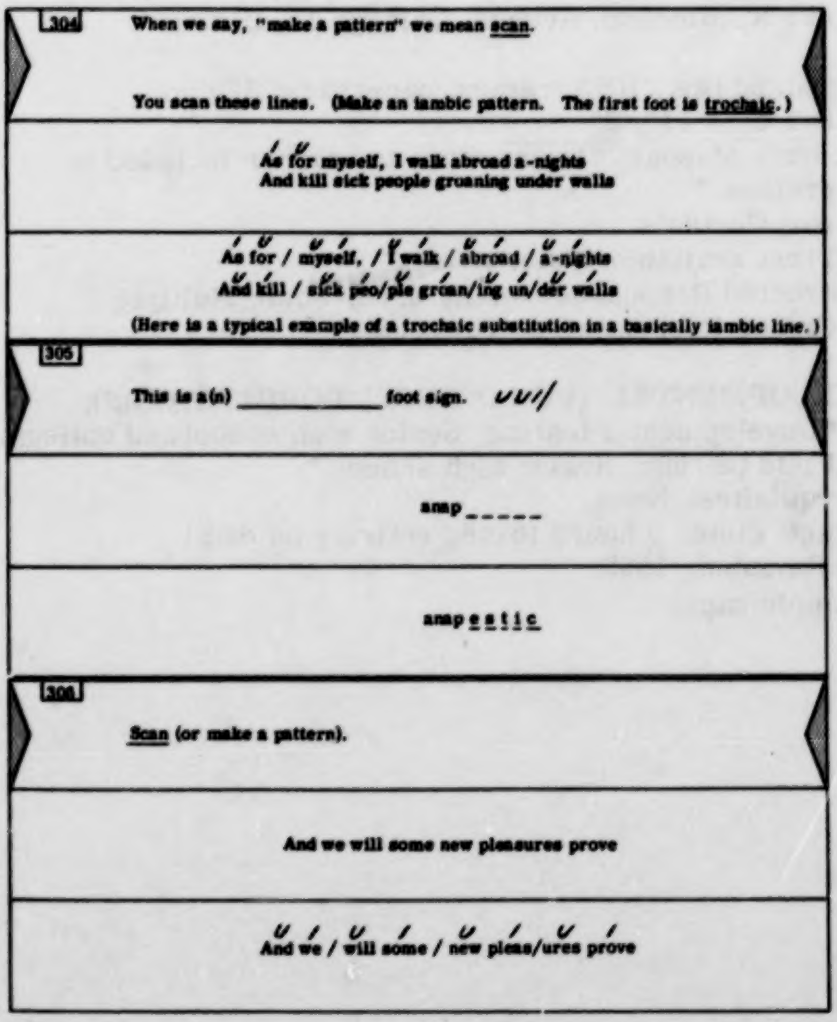
FUNDAMENTALS OF POETRY
FRANKLIN M. DICKEY, Subject Matter Expert
JAMES E. LEAVENWORTH, Programer, General Programmed Teaching Corporation
EDNA M. MORGAN, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1050 frames, paperback, 325 pp., 8-1/2" x 11", $______
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: Senior high school and college. Field testing: Senior high school."
Prerequisites: None.
Average Time: 9 hours (based entirely on data).
Next Revision: 1968.
(1 sample page)

LANGUAGE ARTS

FUNDAMENTALS OF POETRY
Dickey, Leavenworth, Morgan; ENCYCLOPAEDIA
BRITANNICA PRESS
one sample page:



304 When we say, "make a pattern" we mean scan.

You scan these lines. (Make an iambic pattern. The first foot is trochaic.)

Ás fŏr myself, I walk abroad a-nights
And kill sick people groaning under walls

Ás fŏr / mўsélf, / Ĭ wálk / ăbróad / ă-níghts
Ănd kíll / sĭck péo/plĕ gróan/ĭng ún/dĕr wálls

(Here is a typical example of a trochaic substitution in a basically iambic line.)

305 This is a(n) ______________ foot sign. ˘ ˘ /

anap_____

anapestic

306 Scan (or make a pattern).

And we will some new pleasures prove

Ănd wé / wĭll sóme / nĕw pléas/ŭres próve

LANGUAGE ARTS **H.S.-Adult**

THE MEANING OF MODERN POETRY
JOHN CLARK PRATT, Captain U.S. Air Force
Published by DOUBLEDAY & COMPANY, Inc.
575 Madison Avenue, New York, New York

Programed text, 339 frames, hard cover, 399 pp., 8-1/4" x 5-3/8", $5.95.
Table of Contents, Index.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: High school education.
Additional Material Required: Dictionary (optional).
Average Time: 6-8 hours (est.).
Next Revision: "Dependent on publisher's requirements."
(1 sample page)

LANGUAGE ARTS

THE MEANING OF MODERN POETRY
Pratt; DOUBLEDAY & COMPANY
one sample page:

Sample from The Meaning of Modern Poetry

131
(from page 130)

We have seen thus far how a person (a woman), an action (a salute), and a work of art (a painting) have led us into subjects of sexual love, dominion, and the relationship of art to life. In each case we have used the process of abstraction to arrive at the subject, starting with the occasion for the poem at the literal level, then proceeding to the pure idea behind it.

Let us look at another poem now, this one by Robert Frost. At first appearing deceptively simple, this poem is seen to be complex when studied carefully.

The Oven Bird

There is a singer everyone has heard,
Loud, a mid-summer and a mid-wood bird,
Who makes the solid tree trunks sound again.
He says that leaves are old and that for flowers
Mid-summer is to spring as one to ten.
He says the early petal-fall is past
When pear and cherry bloom went down in showers
On sunny days a moment overcast;
And comes that other fall we name the fall.
He says the highway dust is over all.
The bird would cease and be as other birds
But that he knows in singing not to sing.
The question that he frames in all but words
Is what to make of a diminished thing.

First, what type of poem is it?

It is a Shakespearean sonnet.	page 134
It is a sonnet.	page 137
It falls into no specific category, other than lyric.	page 140

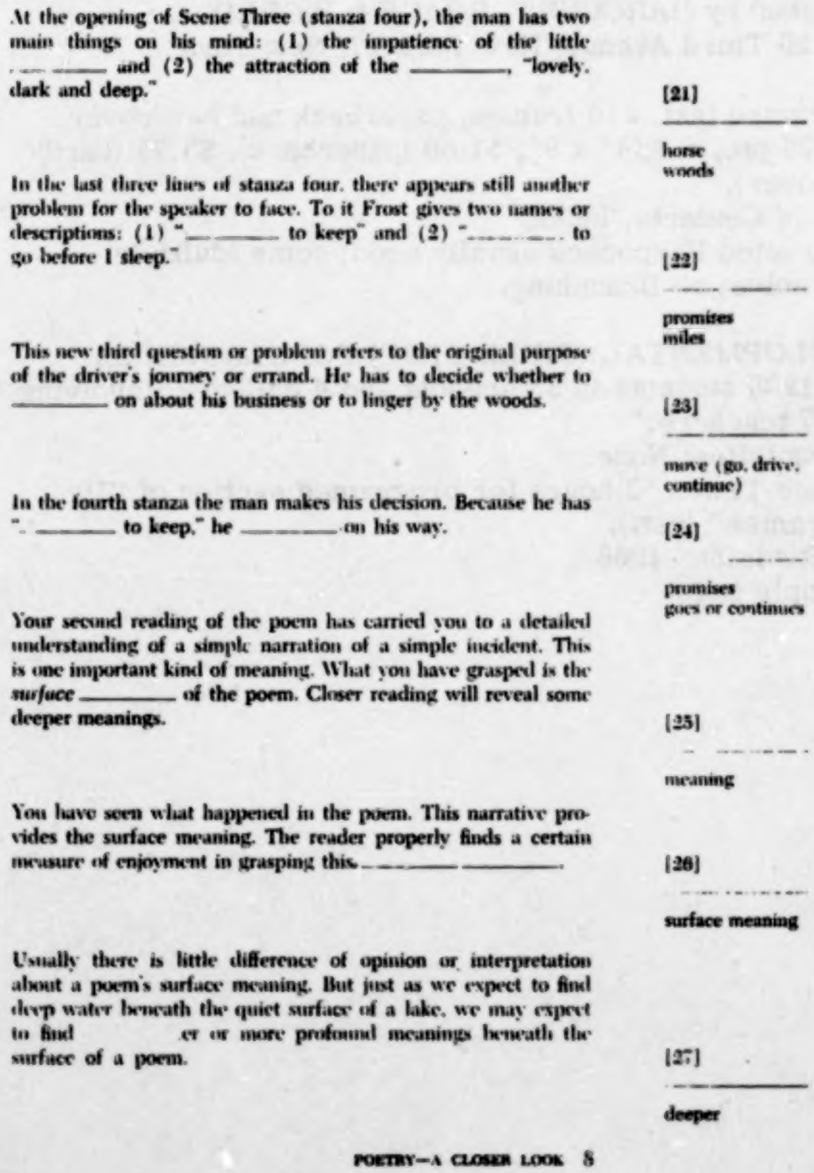
POETRY: A CLOSER LOOK
JAMES M. REID, Harcourt, Brace & World
JOHN CIARDI, Saturday Review poetry editor
LAURENCE PERRINI, Dept. of English, Southern Methodist University
Published by HARCOURT, BRACE & WORLD, 750 Third Avenue, New York 17, New York

Programed text, 210 frames, paperback and hardcover, 128 pp., 6 1/4" x 9", $1.60 (paperback), $3.75 (hardcover).
Table of Contents, Index.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "1200 students in 33 schools and 4 colleges, involving 37 teachers."
Prerequisites: None
Average Time: "3 hours for programed section of 210 frames" (est.).
Next Revision: 1966
(1 sample page)

LANGUAGE ARTS

POETRY: A CLOSER LOOK
Reid, Ciardi, Perrini; HARCOURT, BRACE & WORLD
one sample page:



At the opening of Scene Three (stanza four), the man has two main things on his mind: (1) the impatience of the little ______ and (2) the attraction of the ______, "lovely, dark and deep."

[21]

horse
woods

In the last three lines of stanza four, there appears still another problem for the speaker to face. To it Frost gives two names or descriptions: (1) "______ to keep" and (2) "______ to go before I sleep."

[22]

promises
miles

This new third question or problem refers to the original purpose of the driver's journey or errand. He has to decide whether to ______ on about his business or to linger by the woods.

[23]

move (go, drive, continue)

In the fourth stanza the man makes his decision. Because he has "______ to keep," he ______ on his way.

[24]

promises
goes or continues

Your second reading of the poem has carried you to a detailed understanding of a simple narration of a simple incident. This is one important kind of meaning. What you have grasped is the *surface* ______ of the poem. Closer reading will reveal some deeper meanings.

[25]

meaning

You have seen what happened in the poem. This narrative provides the surface meaning. The reader properly finds a certain measure of enjoyment in grasping this ______ ______.

[26]

surface meaning

Usually there is little difference of opinion or interpretation about a poem's surface meaning. But just as we expect to find deep water beneath the quiet surface of a lake, we may expect to find er or more profound meanings beneath the surface of a poem.

[27]

deeper

POETRY—A CLOSER LOOK 8

EFFECTIVE WRITING
LEIGHTON STEEL*
JANE STAPLEFORD
KELLOGG SMITH
ADRIENNE ZAHNISER, all of U.S.I. Educational Science Division
Published by DOUBLEDAY & COMPANY, Inc.
575 Madison Avenue, New York, New York

Programed text, 450 frames, hard cover, 8-1/4" x 5-3/8", $______.
A similar program, IMPROVING YOUR WRITING, is available in TM format.
Published by EDUCATIONAL SCIENCE DIVISION, U.S. INDUSTRIES, Inc.,
250 Park Avenue, New York, New York
For use in AUTOTUTOR MARK II, $1,250; program reusable, $150.00.
Table of Contents, both programs; Index, programed text.
Unit Test(s) available, machine program.
Multiple Choice and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): College remedial (freshmen) English students.
Prerequisites: High school education.
Additional Material Required: Dictionary (optional).
Average Time: 12-15 hours (est.), programed text; 6-12 hours (est.), machine program.
Next Revision: Undetermined.
(1 sample page)

---

*Machine program only.

LANGUAGE ARTS

EFFECTIVE WRITING
Steel, Stapleford, Smith, Zahnister; DOUBLEDAY & CO.
one sample page:

Sample from Improving Your Writing

57

None of their plans are working out.

YOUR ANSWER: The sentence above is correct.

Right. None, like any, all, more, most, and some, takes a singular or a plural verb, depending upon the word to which it refers. In the sentence above, none refers to plans, and thus takes the plural verb are.

Here is another rule:

6. Collective nouns commonly take singular verbs.

Collective nouns (like herd, class, committee, crowd) take singular verbs because we think of them as acting as a unit. For example:

The class is bored.

We'll abide by what the committee decides.

Collective nouns do, however, take plural verbs when the parts or members of the collection are thought of as individuals.

For example:

The committee were always arguing among themselves.

Which of the following sentences is correct?

The number of such incidents has greatly decreased. H

If the government decide against war, the press will be disappointed. G

The basketball team are well trained in zone defense. F

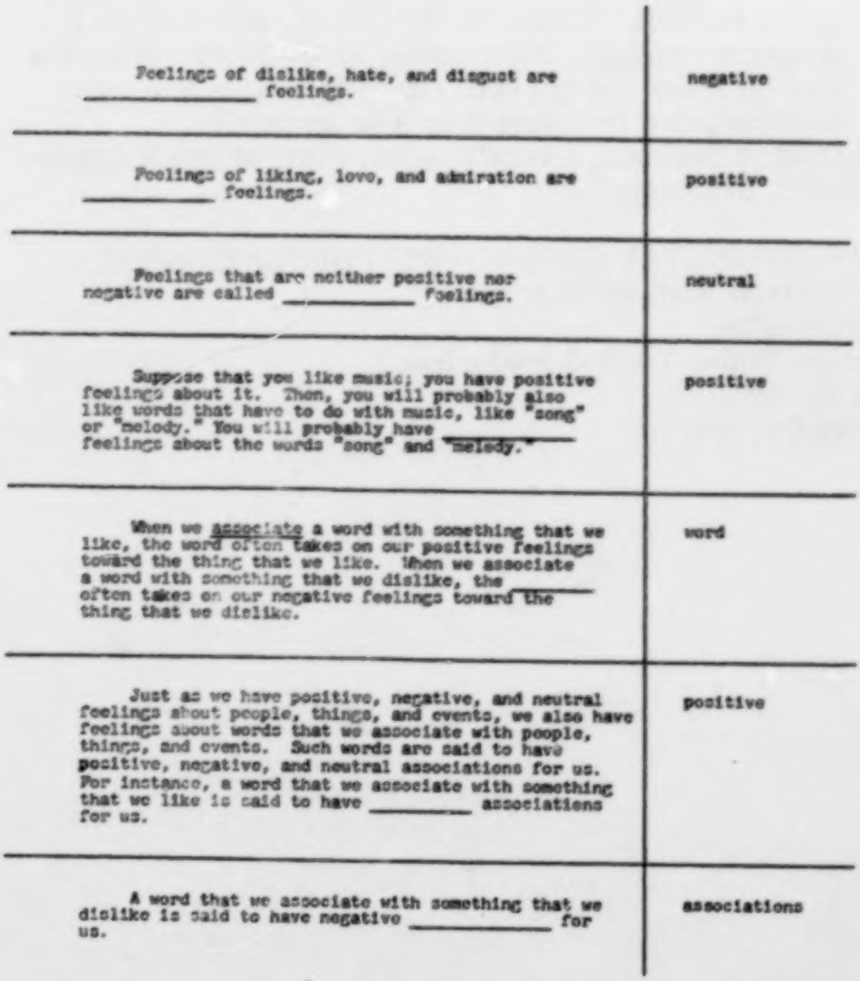
PERSUASIVE WORDS
Effective Word Usage
HELEN KAIN, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHINE MACHINE, $20 (approx.); program reusable, 200 frames, $2.00-$2.50. (Machine may be marketed in retail channels at this $20 combination price including 3 or 4 programs.)
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Private and public schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

LANGUAGE ARTS

PERSUASIVE WORDS
Kain; HONOR PRODUCTS COMPANY
one sample page:



Feelings of dislike, hate, and disgust are ______ feelings.	negative
Feelings of liking, love, and admiration are ______ feelings.	positive
Feelings that are neither positive nor negative are called ______ feelings.	neutral
Suppose that you like music; you have positive feelings about it. Then, you will probably also like words that have to do with music, like "song" or "melody." You will probably have ______ feelings about the words "song" and "melody."	positive
When we associate a word with something that we like, the word often takes on our positive feelings toward the thing that we like. When we associate a word with something that we dislike, the ______ often takes on our negative feelings toward the thing that we dislike.	word
Just as we have positive, negative, and neutral feelings about people, things, and events, we also have feelings about words that we associate with people, things, and events. Such words are said to have positive, negative, and neutral associations for us. For instance, a word that we associate with something that we like is said to have ______ associations for us.	positive
A word that we associate with something that we dislike is said to have negative ______ for us.	associations

PRINCIPLES OF DEBATE
PETER PROUSE, Subject Matter Expert
L. S. HARMS, Special Consultant
WAYNE T. ALCOCK, EDNA M. MORGAN, HENRY C. ELLIS, Programers, GPTC
MARK W. UTTON, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 2000 frames, paperback, 250 pp., 8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in the preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "High school and college students in Albuquerque, New Mexico; high school students in Roanoke, Virginia."
Prerequisites: "9th grade reading level."
Average Time: 25 hours (based entirely on data).
Next Revision: Undetermined.
(2 sample pages)

LANGUAGE ARTS

PRINCIPLES OF DEBATE
Prouse, Harms, Alcock, Morgan, Ellis, Utton;
ENCYCLOPAEDIA BRITANNICA PRESS
2 sample pages:

57) Beginning with the First Affirmative Speaker, the teams alternate in giving constructive speeches. The second constructive speech is given by the First ____ Speaker.		Negative
58) The third constructive speech is given by the (1) ____ Affirmative Speaker, and the fourth, or last, constructive speech is given by the (2) ____ ____ Speaker.	(1) (2)	(1) Second (2) Second Negative
59) The speaking order of the constructive speeches is _ _ _ _ (Complete the answers)	(1) First Affirmative (2) (3) (4) Second Negative	(2) First Negative (3) Second Affirmative
60) The speaking order of the constructive speeches is _ _ _ _	(1) (2) (3) (4)	(1) First Affirmative (2) First Negative (3) Second Affirmative (4) Second Negative
61) In making rebuttal speeches, the teams alternate beginning with the Negative team. The first constructive speech is made by the (1) ____ ____ Speaker, but the first rebuttal speech is made by the (2) ____ ____ Speaker.	(1) (2)	(1) First Affirmative (2) First Negative
62) The first of the four rebuttal speeches in a debate is made by a member of the ____ team.		Negative
63) Beginning with the First Negative Speaker, the teams alternate in giving rebuttal speeches. The second rebuttal speech is given by the ____ ____ Speaker.		First Affirmative
64) The third rebuttal speech is given by the (1) ____ Negative Speaker, and the fourth, or last, rebuttal speech is given by the (2) ____ ____ Speaker.	(1) (2)	(1) Second (2) Second Affirmative

49) The first speech in a debate is made by the (1)_____ _____ Speaker. The debater who speaks immediately thereafter is the (2) _____ _____ Speaker.	(1) (2)	(1) First Affirmative (2) First Negative
50) The third speech in a debate is a (1)_____ speech made by the (2)_____ _____ Speaker.	(1) (2)	(1) constructive (2) Second Affirmative
51) The fourth and final constructive speech in a debate is made by the _____ _____Speaker.		Second Negative
52) Of the eight speeches made in a debate, the first four are called (1) _____ speeches and the last four are called (2) _____ speeches in which the speaker tries to rebuild his team's arguments.	(1) (2)	(1) constructive (2) rebuttal
53) Each speaker's second speech is his (1)_____ speech, in which he tries to (2) _____ his team's arguments after they have been attacked.	(1) (2)	(1) rebuttal (2) rebuild
54) Each speaker's first speech is his _____ speech.		constructive
55) The second speech made by the Second Affirmative Speaker is his _____ speech.		rebuttal
56) None of the rebuttal speeches are made until all of the _____ speeches have been completed.		constructive

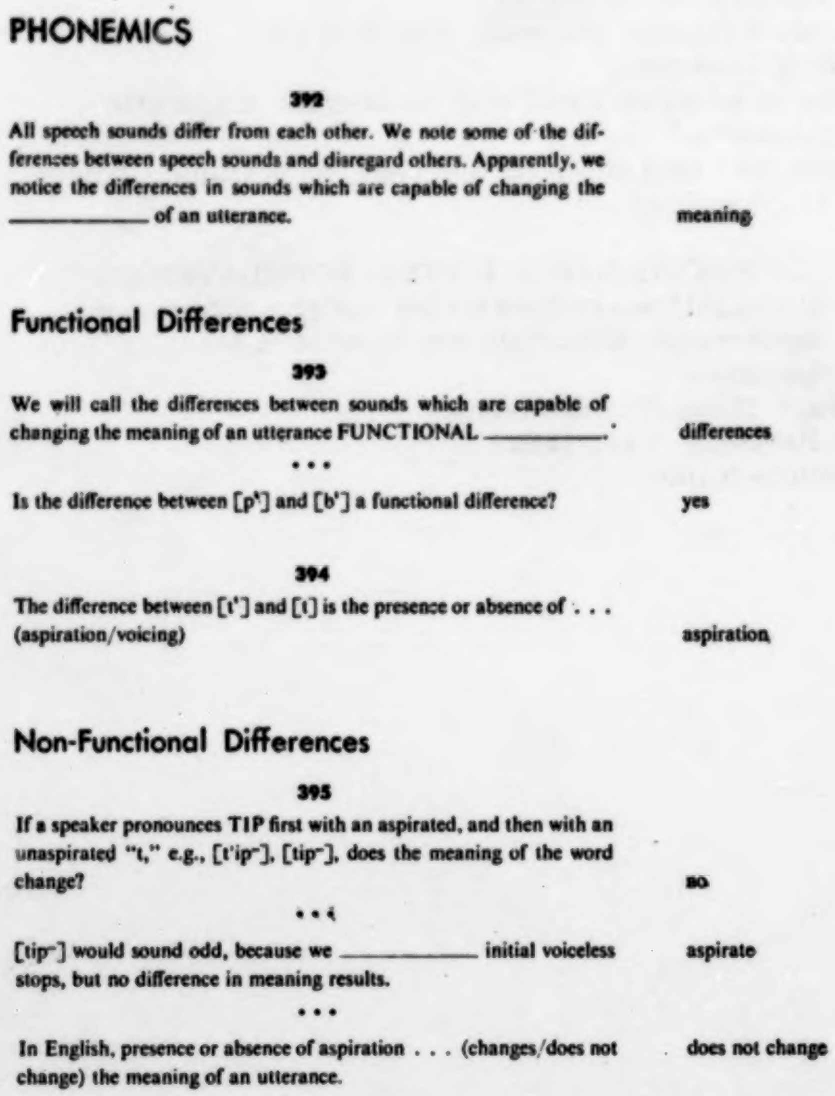
A PROGRAMED INTRODUCTION TO LINGUISTICS:
Phonetics and Phonemics
CYNTHIA D. BUCHANAN, programer with
Sullivan Associates
Published by: D. C. HEATH and Co.,
285 Columbus Ave., Boston, Mass.

Programed text, 1212 frames, 270 pp., 8 1/2" x 11", soft bound, $5.00.
Table of Contents.
Unit Test(s) available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Hollins College: undergraduate and graduate students.
N.D.E.A. Summer language institute at Converse College: language teachers."
Prerequisites:
Average Time: 14 hours (based entirely on data).
Next Revision:
(1 sample page)

LANGUAGE ARTS

A PROGRAMED INTRODUCTION TO LINGUISTICS
Buchanan; D. C. HEATH
one sample page:



PHONEMICS

392

All speech sounds differ from each other. We note some of the differences between speech sounds and disregard others. Apparently, we notice the differences in sounds which are capable of changing the ________ of an utterance.	meaning

Functional Differences

393

We will call the differences between sounds which are capable of changing the meaning of an utterance FUNCTIONAL ________.	differences
• • •	
Is the difference between [p'] and [b'] a functional difference?	yes

394

The difference between [t'] and [t] is the presence or absence of . . . (aspiration/voicing)	aspiration

Non-Functional Differences

395

If a speaker pronounces TIP first with an aspirated, and then with an unaspirated "t," e.g., [t'ip⁻], [tip⁻], does the meaning of the word change?	no
• • •	
[tip⁻] would sound odd, because we ________ initial voiceless stops, but no difference in meaning results.	aspirate
• • •	
In English, presence or absence of aspiration . . . (changes/does not change) the meaning of an utterance.	does not change

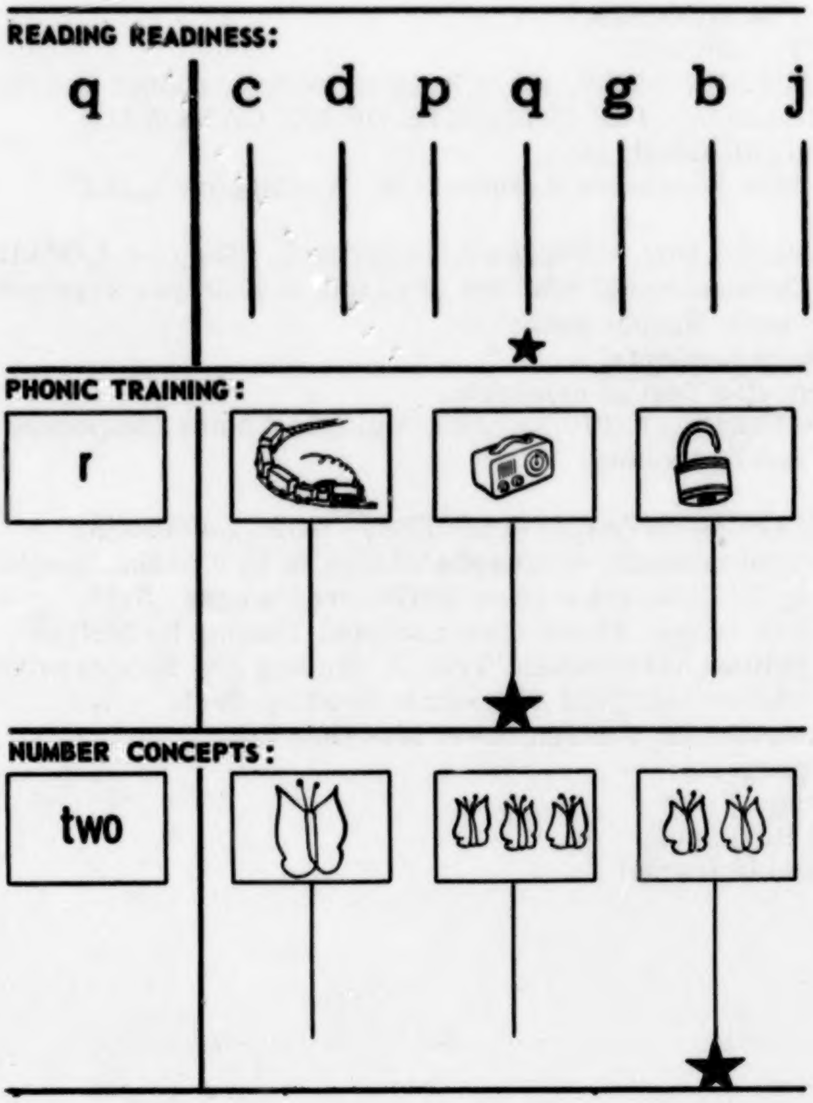
STUDENTUTOR LIBRARY OF MATCHING EXERCISES
TECHNICAL STAFF, General Education, Inc.
Published by GENERAL EDUCATION, Inc.,
96 Mount Auburn St., Cambridge 38, Mass.

For use in STUDENTUTOR, program reusable, 360 frames, programs supplied in kit which contains 5 machines and 18 scrolls, $45.00.
Teacher's Manual available, free with kit.
Table of Contents.
"Items in program itself may be used for diagnostic purposes."
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Kindergarten children tested one at a time under supervision. Materials were tested in teaching machines.
Average Time: 5 hours (est.).
Next Revision: Fall, 1963.
(1 sample frame)

LANGUAGE ARTS

STUDENTUTOR LIBRARY OF MATCHING EXERCISES
Technical Staff; GENERAL EDUCATION
one sample frame:


READING READINESS:
q
c d p q g b j
PHONIC TRAINING:
r
NUMBER CONCEPTS:
two

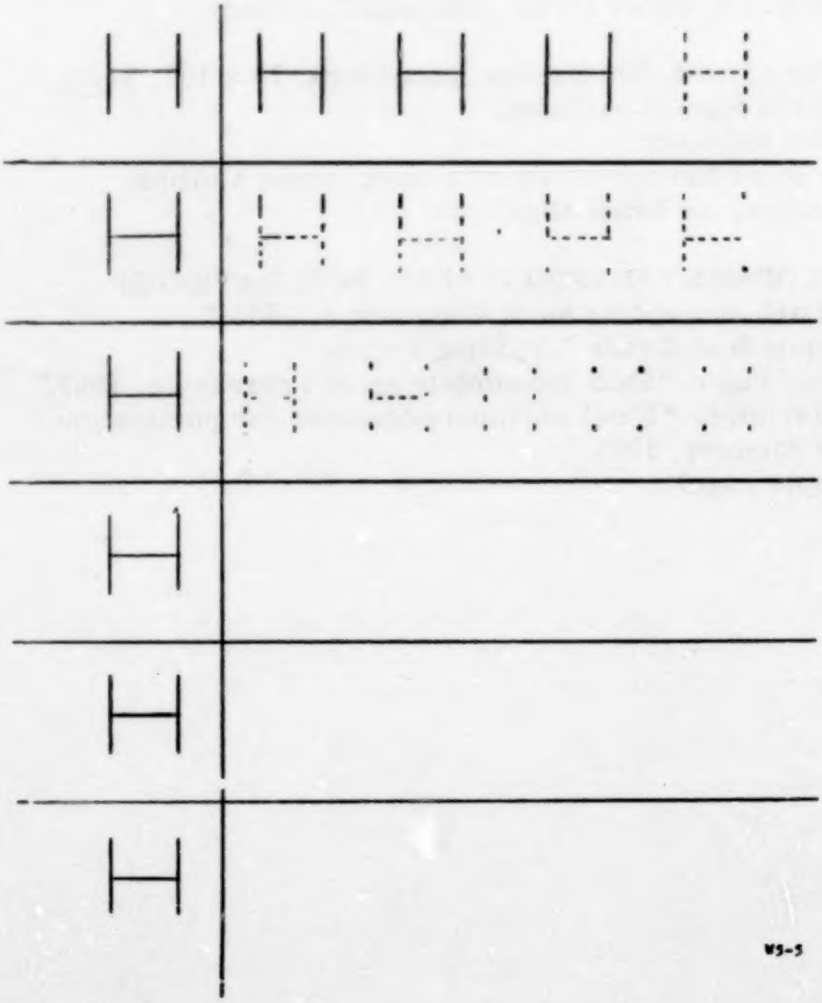
THE BASAL PROGRESSIVE CHOICE READING PROGRAM.
MYRON WOOLMAN
RUTH ANN DAVY
LOUISE RAMIREZ
MARCIA WOOLMAN
PATTI LOWERY
ALLEN PETERSON, all of Institute of Educational Research.
Published by: THE INSTITUTE OF EDUCATIONAL
RESEARCH, Inc.,
2226 Wisconsin Avenue, N.W.,Washington 7, D.C.

Programed text, 400 frames, Paperback, 428 pp., 8 1/2"x11"
Developmental editions available at $1.00 per segment.
Teacher's Manual available.
Table of Contents.
Diagnostic Test(s) available.
Some Constructed Responses, Multiple Choice Responses and Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"500 mentally retarded children in 33 classes, taught by 33 different teachers. Children's ages: 6-18; I.Q. range: 20-80. Pre and Post Testing by Metropolitan Achievement Test in Reading and Progressive Choice Marginal Diagnostic Reading Test.
Prerequisites: Reading level less than 2.0 at start of program.
Average Time:
Next Revision:
(1 sample frame)

LANGUAGE ARTS

THE BASAL PROGRESSIVE CHOICE READING PROGRAM
Woolman, Davy, Ramirez, Woolman, Lowery, Peterson;
THE INSTITUTE OF EDUCATIONAL RESEARCH
one sample frame:



692-898 O-63—16

HOW TO IMPROVE YOUR READING

JANE BOYD LARIMORE, Programer, Learning Incorporated
WILLARD ABRAHAM, Dept. of Educational Services, Arizona State University
Published by CORONET INSTRUCTIONAL FILMS, 65 E. So. Water Street, Chicago 1, Illinois.

Programed text, 300 frames, paperback, 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Data incomplete as of February 8, 1963."
Prerequisites: Grade 7 reading ability.
Average Time: "Data incomplete as of February 8, 1963."
Next Revision: "Final revision scheduled for publication in Summer, 1963."
(1 sample page)

LANGUAGE ARTS

HOW TO IMPROVE YOUR READING
Larimore, Abraham; CORONET INSTRUCTIONAL FILMS
one sample page:

Example 1 George was always short of money, but he was too timorous to ask his boss for a raise.	
2-6 The sentence in which a word is used is the context of that word. Read Example 1. We can call the sentence in which timorous is used, the c________.	context •
2-7 Word recognition is one of the steps toward reading improvement and one of the aids to this step is t xt.	context •
2-8 Look at Example 1. Try to recognize the meaning of timorous by its context. Timorous means ________ (bold/shy).	shy •
2-9 The sentence in which a word is used is the ________ of the word.	context •
Example 2 Sarah is so phlegmatic that she is always the last person finished with her work.	
2-10 Read Example 2. Use the context to help you recognize the meaning of phlegmatic. Phlegmatic means ________.	slow •
2-11 You can use the context of a word to help you recognize the ________ of unfamiliar words.	meanings

MODERN ENGLISH SERIES: FIRST STEPS IN READING
A Programed Reading Primer

L. BENJAMIN WYCKOFF
JOHN FULLILOVE
POLO C. DE BACA
THEODORE S. STRANCZEK
PATRICIA J. ANDREGO, all of Teaching Materials Corp.

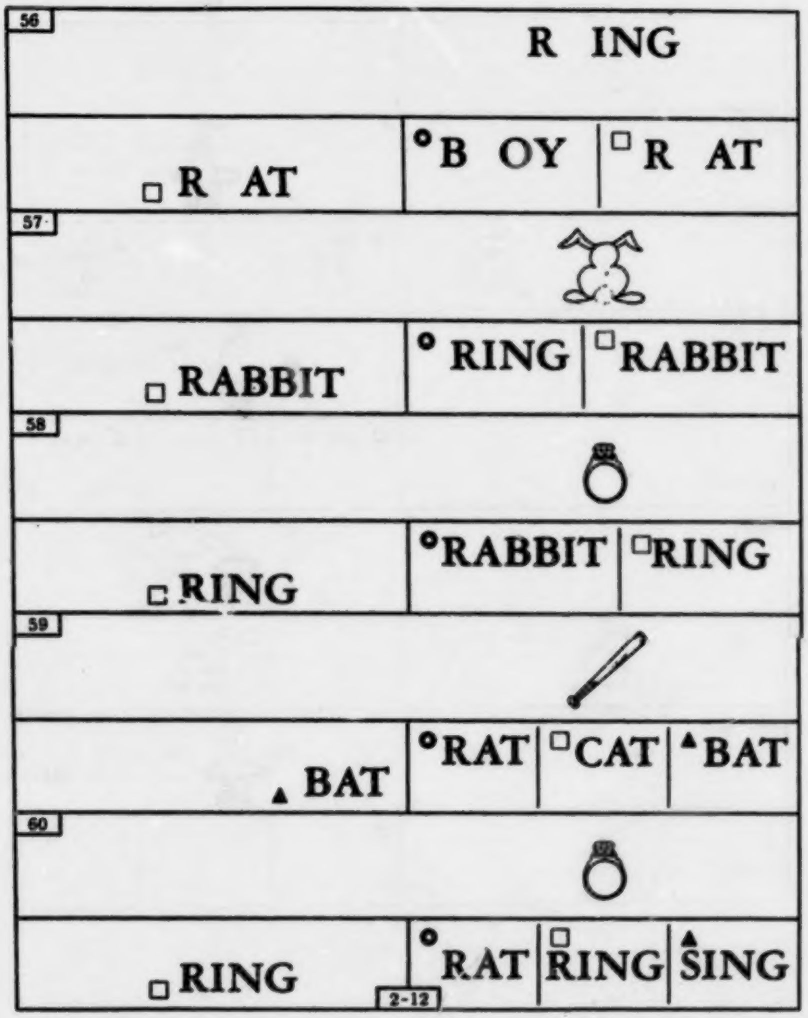
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York

For use in MIN/MAX II machine, $25.00; program reusable, 2,500 frames $10.00.
Teacher's Manual: General Manual available for all TMI-Grolier programs.
Table of Contents.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Students age 6 years 1 month to 9 years 11 months, average age 7 years 0 months."
Prerequisites: "Elementary motor skills with pencil. Ability to comprehend simple instructions.
Average Time: 15-35 hours (based entirely on data); standard deviation, .84 hours.
Next Revision: December, 1963.
(2 sample pages)

LANGUAGE ARTS-REMEDIAL READING

MODERN ENGLISH SERIES: FIRST STEPS IN READING
Wyckoff, Fullilove, De Baca, Stranczek, Andrego;
TEACHING MATERIALS CORPORATION
2 sample pages:



56

R ING

☐ R AT

○ B OY | ☐ R AT

57

☐ RABBIT

○ RING | ☐ RABBIT

58

☐ RING

○ RABBIT | ☐ RING

59

▲ BAT

○ RAT | ☐ CAT | ▲ BAT

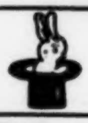
60

☐ RING

○ RAT | ☐ RING | ▲ SING

2-12

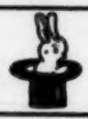
16



☐ The rabbit is in the hat.

☐ The rabbit is in the hat.

17

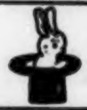


▲ The rabbit is in the hat.

○ The spoon is in the cup.

▲ The rabbit is in the hat.

18



The ________ is in the hat.

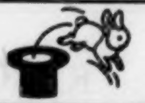
○ rabbit

○ rabbit

☐ hat

▲ spoon

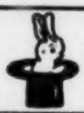
19



☐ The rabbit was in the hat.

☐ The rabbit was in the hat.

20



The rabbit ____ in the hat.

☐ is

○ to

☐ is

▲ sing

LANGUAGE ARTS Prim.

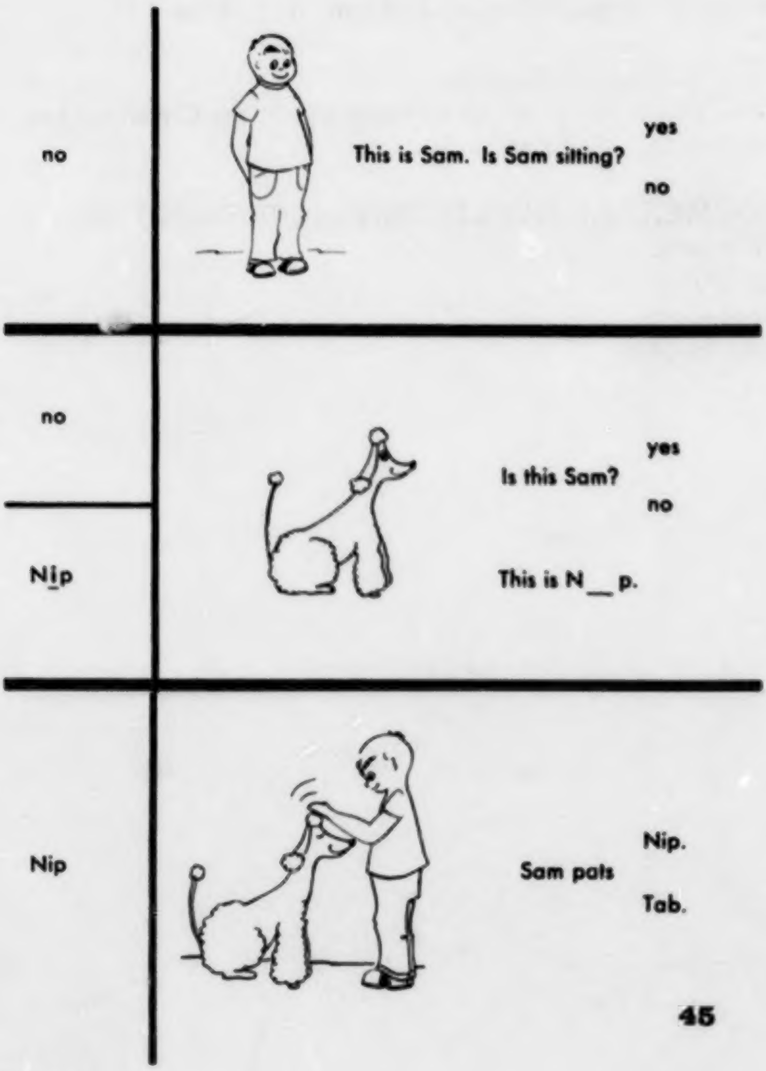
PROGRAMMED READING
CYNTHIA DEE BUCHANAN, Sullivan Associates
Published by McGRAW HILL BOOK COMPANY, Inc.,
330 West 42nd Street, New York City.

Programed text, paperback, 144 pp., 8 1/4" x 11",
$___.
Teacher's Manual available.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Average Time:
Next Revision:
(1 sample page)

LANGUAGE ARTS

PROGRAMMED READING
Buchanan; McGRAW HILL BOOK COMPANY
one sample page:



no

This is Sam. Is Sam sitting?

yes
no

no

Is this Sam?

yes
no

Nip

This is N__p.

Nip

Sam pats

Nip.
Tab.

45

LANGUAGE ARTS Elem.

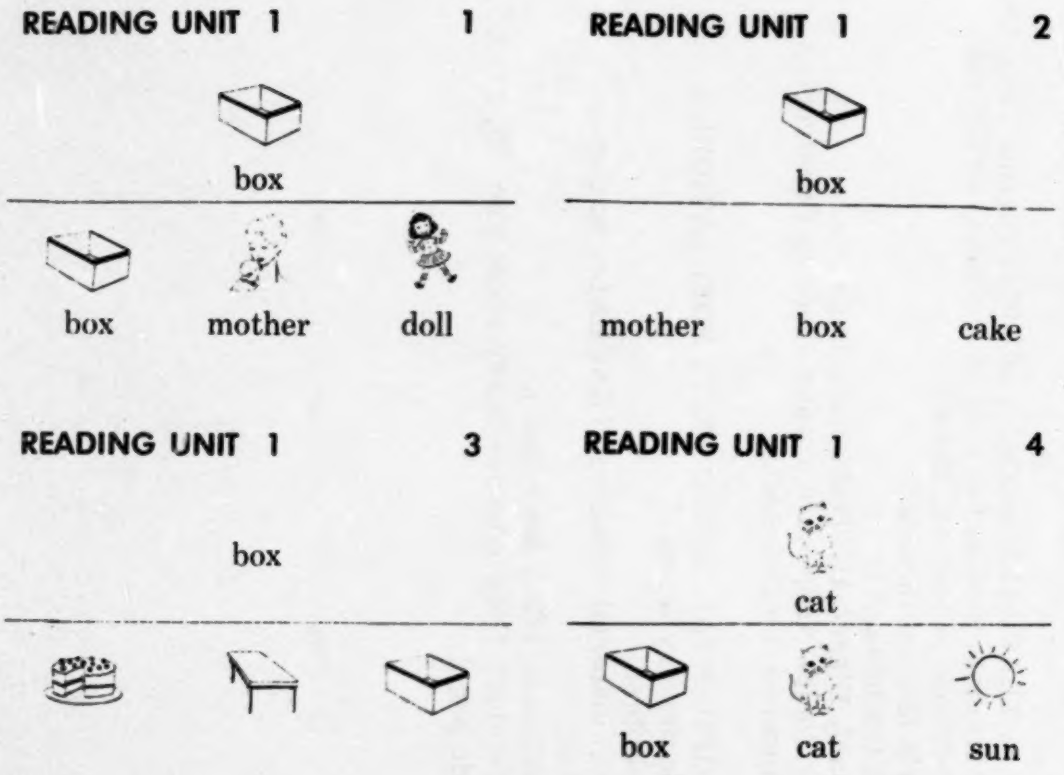
READING
Word Recognition
CHARLES WILLIAMS, Programer
Published by PUBLISHERS Co.,
1106 Connecticut Avenue, N.W., Washington, D.C.

For use in TEACHALL machine, $69.95; program reusable, 800 frames, included in cost of machine, additional 800-frame programs, $24.95.
Teacher's Manual included.
Table of Contents.
Unit, Final, Diagnostic Test(s) available.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Elementary levels."
Prerequisites:
Additional material required: TEACHALL machine, $69.95.
Average Time: 1/2-1 hour (est.).
Next Revision: "New courses ready about Feb. 15, 1963."
(1 sample page)

LANGUAGE ARTS

READING
Williams; PUBLISHERS CO.
one sample page:



READING UNIT 1 1

box

box mother doll

READING UNIT 1 2

box

mother box cake

READING UNIT 1 3

box

READING UNIT 1 4

cat

box cat sun

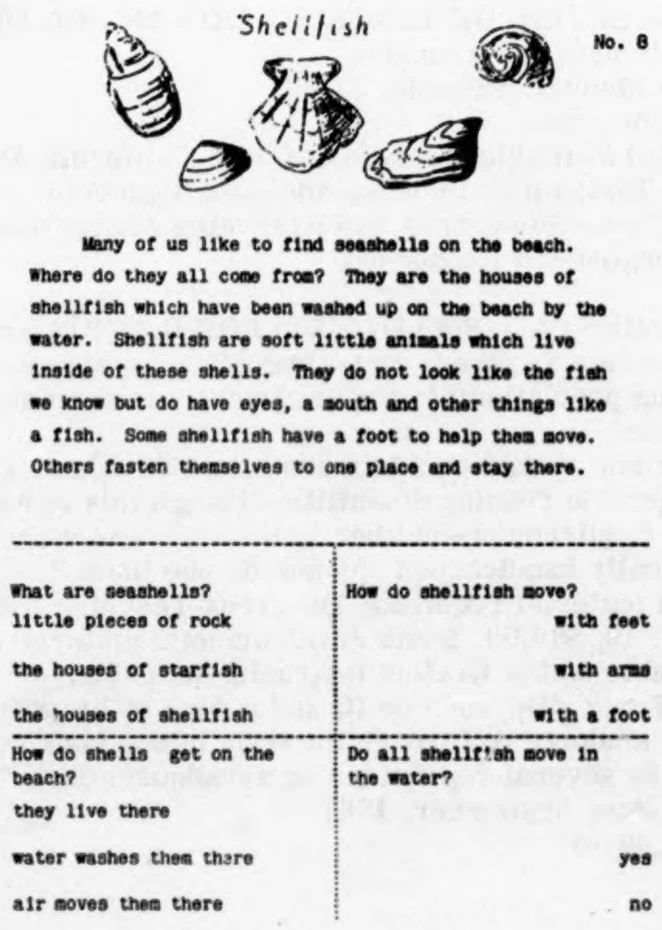
REMEDIAL READING
A Set of 16 Automated Workbooks
Prepared through the facilities of THE DEVEREUX FOUNDATION
Published by DEVEREUX TEACHING AIDS,
Box 717, Devon, Pennsylvania

Programed workbooks, 2016 frames, paperback, 18 pp. in each book, 7" x 11". "Available only to special education facilities for exploratory use. For further information contact Dr. Henry Platt, Director of Training, The Devereux Foundation, Devon, Pennsylvania.
For use in DEVEREUX TEACHING AID - MODEL 50, $89.50, program reusable.
Teacher's Manual available, $1.00.
Table of Contents.
Unit Test(s) available; coordinated with California Achievement Test, which includes adequate diagnostic profile.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): Both within Devereux and other school systems.
Other using population(s): Experimentally in normal grade schools.
Prerequisites: "Most booklets usable with students exhibiting specific reading disabilities though this is naturally not a requirement—neither is the ability to write, so physically handicapped can and do use them."
Additional material required: Devereux Teaching Aid - Model 50, $89.00. Some developmental material available on the Graflex Instructor machine.
Average Time: "Depends on IQ and nature of limitations. Many students go through the book in one hour but require several repetitions on subsequent days."
Next Revision: September, 1963.
(1 sample page)

LANGUAGE ARTS

REMEDIAL READING
Devereux Foundation; DEVEREUX TEACHING AIDS
one sample page:



Shellfish

No. 8

Many of us like to find seashells on the beach. Where do they all come from? They are the houses of shellfish which have been washed up on the beach by the water. Shellfish are soft little animals which live inside of these shells. They do not look like the fish we know but do have eyes, a mouth and other things like a fish. Some shellfish have a foot to help them move. Others fasten themselves to one place and stay there.

What are seashells?	How do shellfish move?
little pieces of rock	with feet
the houses of starfish	with arms
the houses of shellfish	with a foot

How do shells get on the beach?	Do all shellfish move in the water?
they live there	
water washes them there	yes
air moves them there	no

STEPS TO BETTER READING, Book One

WILBUR SCHRAMM, Institute for Communication Research, Stanford University

HERBERT POTELL, New Utrecht High School, Brooklyn, New York.

GEORGE D. SPACHE, Reading Laboratory and Clinic, University of Florida.

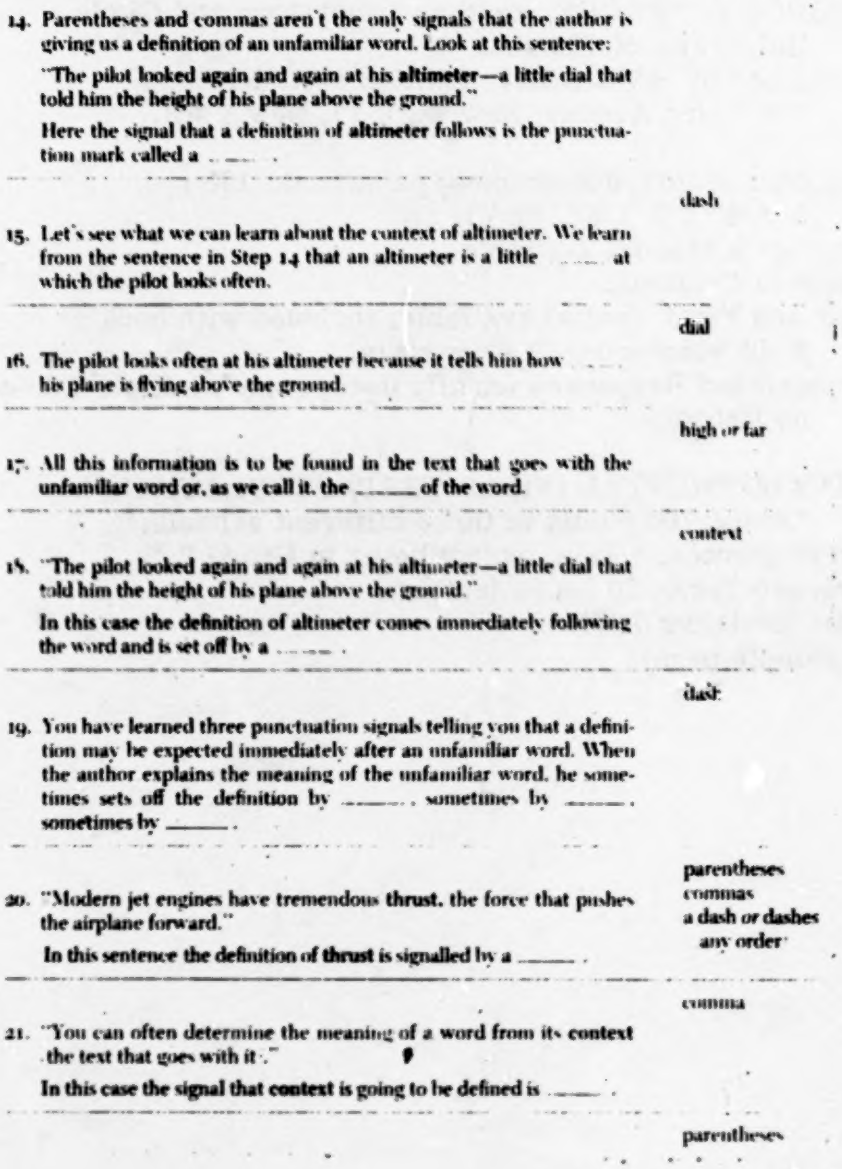
Published by HARCOURT, BRACE & WORLD,
750 Third Avenue, New York 17, New York.

Programed text, 808 frames, paperback, 176 pp., 6 3/4" x 9 1/8", $1.72.
Teacher's Manual available.
Table of Contents.
Unit and Final Test(s) available, included with book or $ .40 when ordered separately.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "About 100 pupils in three different schools."
Prerequisites: "None, except being in Grade 7."
Average Time: 20 hours (est.).
Next Revision: 1968.
(1 sample page)

LANGUAGE ARTS

STEPS TO BETTER READING
Schramm, Potell, Spache; HARCOURT, BRACE & WORLD
one sample page:



14. Parentheses and commas aren't the only signals that the author is giving us a definition of an unfamiliar word. Look at this sentence:

"The pilot looked again and again at his **altimeter**—a little dial that told him the height of his plane above the ground."

Here the signal that a definition of **altimeter** follows is the punctuation mark called a ______ .

dash

15. Let's see what we can learn about the context of altimeter. We learn from the sentence in Step 14 that an altimeter is a little ______ at which the pilot looks often.

dial

16. The pilot looks often at his altimeter because it tells him how ______ his plane is flying above the ground.

high *or* far

17. All this information is to be found in the text that goes with the unfamiliar word or, as we call it, the ______ of the word.

context

18. "The pilot looked again and again at his altimeter—a little dial that told him the height of his plane above the ground."

In this case the definition of altimeter comes immediately following the word and is set off by a ______ .

dash

19. You have learned three punctuation signals telling you that a definition may be expected immediately after an unfamiliar word. When the author explains the meaning of the unfamiliar word, he sometimes sets off the definition by ______ , sometimes by ______ , sometimes by ______ .

parentheses
commas
a dash *or* dashes
(any order)

20. "Modern jet engines have tremendous **thrust**, the force that pushes the airplane forward."

In this sentence the definition of **thrust** is signalled by a ______ .

comma

21. "You can often determine the meaning of a word from its **context** (the text that goes with it)."

In this case the signal that **context** is going to be defined is ______ .

parentheses

BEGINNING SIGHT VOCABULARY
THORWALD ESBENSEN
DONALD HURST
CHARLES JENKS
DAVID SHIER, all of Merit Associates (formerly Educational Development Associates)
Published by E-Z SORT SYSTEMS, LTD.,
45 Second Street, San Francisco, California

Programed text, 945 frames, edge-punched cards, 105 "lesson units," $174.65.
Teacher's Manual available, included with program
Table of Contents, Index.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

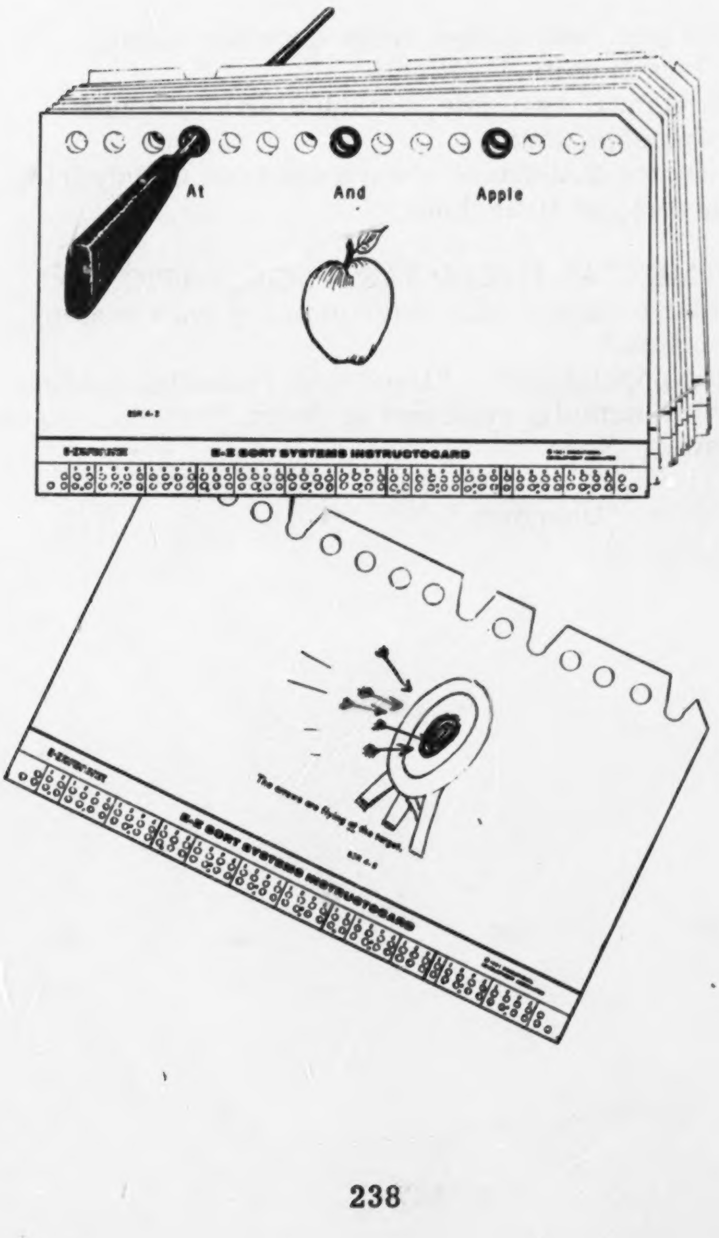
DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Primary classes and upper primary with reading difficulties."
Other using population(s): "Used with remedial readers and with mentally retarded students."
Prerequisites: None
Average Time: 30 hours (est.).
Next Revision: "Unknown."
(2 sample pages)

LANGUAGE ARTS

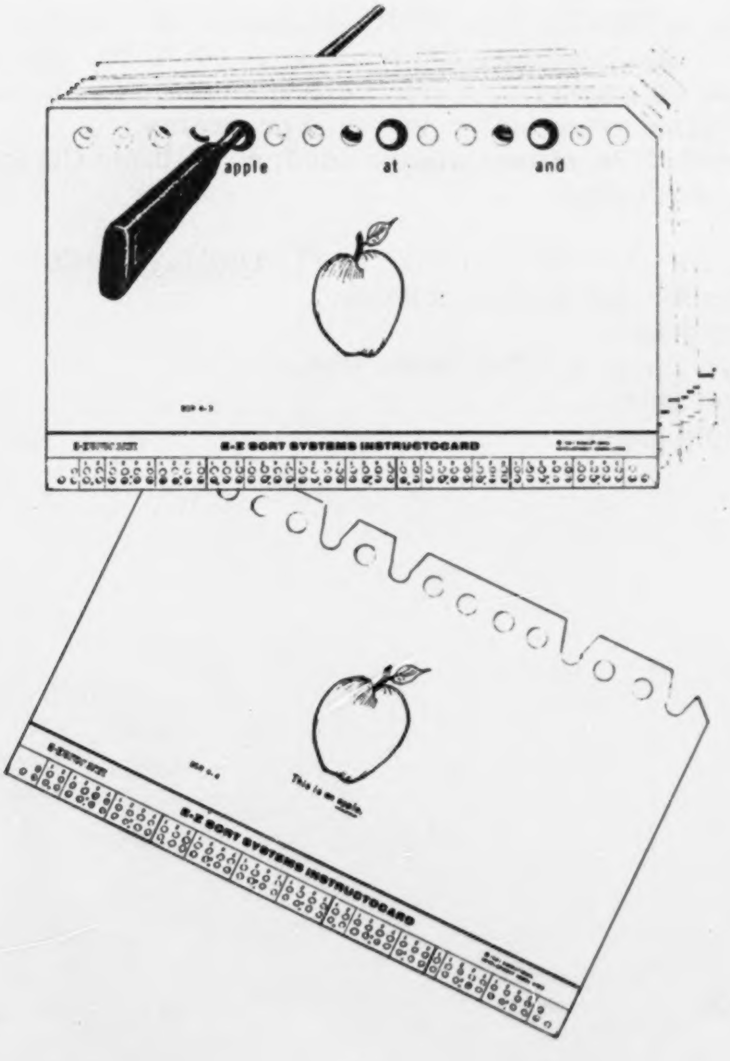
BEGINNING SIGHT VOCABULARY

Esbensen, Hurst, Jenks, Shier; E-Z SORT SYSTEMS, LTD.
2 sample pages:

BASIC SIGHT VOCABULARY INCORRECT RESPONSE


At
And
Apple
E-Z SORT SYSTEMS INSTRUCTOCARD
The arrows are flying at the target.
E-Z SORT SYSTEMS INSTRUCTOCARD

BASIC SIGHT VOCABULARY CORRECT RESPONSE


apple
at
and
E-Z SORT SYSTEMS INSTRUCTOCARD
This is an apple.
E-Z SORT SYSTEMS INSTRUCTOCARD

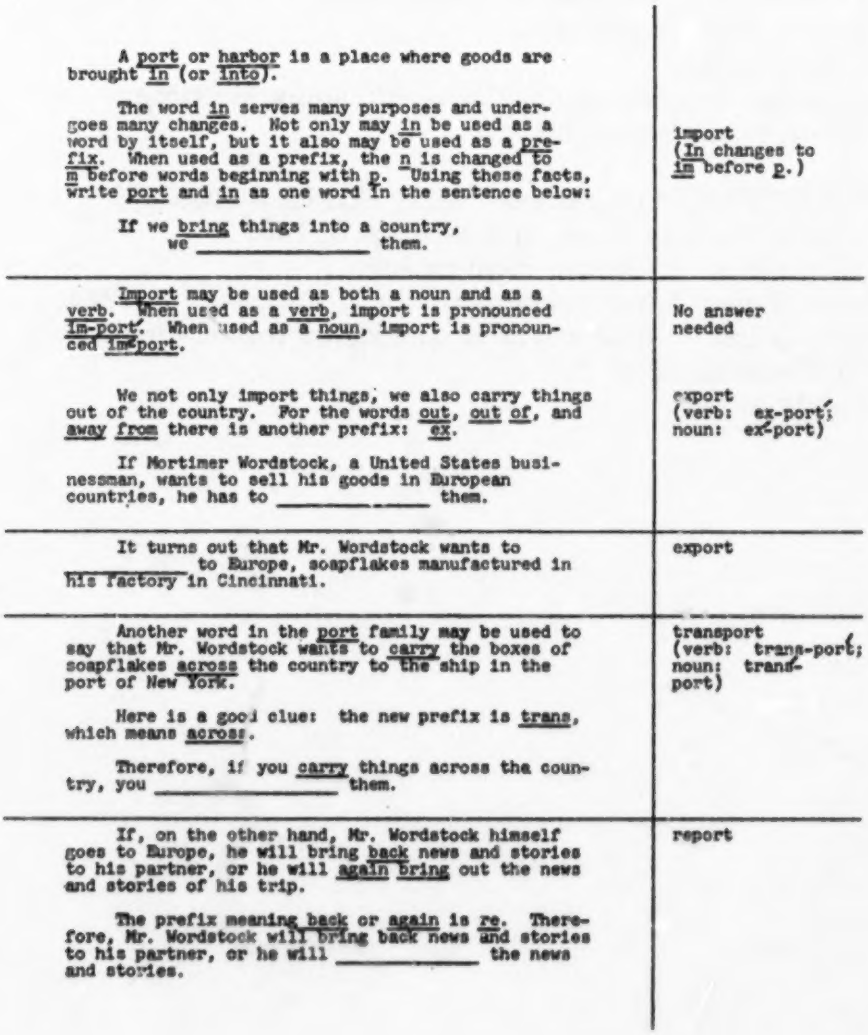
BUILDING WORDS
Structural Analysis of Words
RENATE LEPEHNE, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.); program reusable, 200 frames, $2.00-$2.50. (Machine may be marketed in retail channels at this $20 combination price including 3 or 4 programs.)
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

LANGUAGE ARTS

BUILDING WORDS
Lepehne; HONOR PRODUCTS COMPANY
one sample page:



A port or harbor is a place where goods are brought in (or into). The word in serves many purposes and undergoes many changes. Not only may in be used as a word by itself, but it also may be used as a prefix. When used as a prefix, the n is changed to m before words beginning with p. Using these facts, write port and in as one word in the sentence below: If we bring things into a country, we ______________ them.	import (In changes to im before p.)
Import may be used as both a noun and as a verb. When used as a verb, import is pronounced im-port´. When used as a noun, import is pronounced im´port.	No answer needed
We not only import things, we also carry things out of the country. For the words out, out of, and away from there is another prefix: ex. If Mortimer Wordstock, a United States businessman, wants to sell his goods in European countries, he has to ______________ them.	export (verb: ex-port´; noun: ex´port)
It turns out that Mr. Wordstock wants to __________ to Europe, soapflakes manufactured in his factory in Cincinnati.	export
Another word in the port family may be used to say that Mr. Wordstock wants to carry the boxes of soapflakes across the country to the ship in the port of New York. Here is a good clue: the new prefix is trans, which means across. Therefore, if you carry things across the country, you ______________ them.	transport (verb: trans-port´; noun: trans´port)
If, on the other hand, Mr. Wordstock himself goes to Europe, he will bring back news and stories to his partner, or he will again bring out the news and stories of his trip. The prefix meaning back or again is re. Therefore, Mr. Wordstock will bring back news and stories to his partner, or he will ______________ the news and stories.	report

LANGUAGE ARTS Fifth Grade

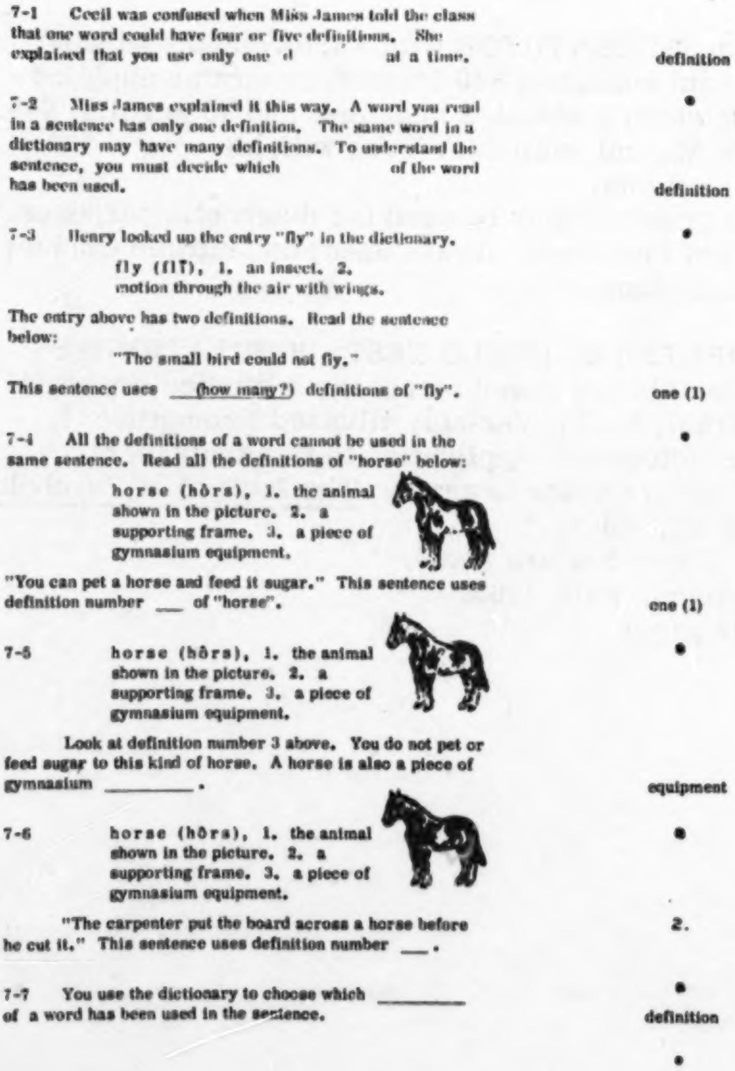
DAVID DISCOVERS THE DICTIONARY
NANCY GRANIERI WILLFORD, Programer, Learning Incorporated
Published by CORONET INSTRUCTIONAL FILMS, 65 E. So. Water Street, Chicago 1, Illinois

Programed text, 300 frames, paperback, 7"x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Data incomplete as of February 8, 1963."
Prerequisites: 4th grade reading level.
Average Time: "Data incomplete as of February 8, 1963."
Next Revision: "Final revision scheduled for publication in Summer, 1963."
(1 sample page)

LANGUAGE ARTS

DAVID DISCOVERS THE DICTIONARY
Willford; CORONET INSTRUCTIONAL FILMS
one sample page:



7-1 Cecil was confused when Miss James told the class that one word could have four or five definitions. She explained that you use only one d at a time. **definition**

●

7-2 Miss James explained it this way. A word you read in a sentence has only one definition. The same word in a dictionary may have many definitions. To understand the sentence, you must decide which of the word has been used. **definition**

●

7-3 Henry looked up the entry "fly" in the dictionary.

fly (flī), 1. an insect. 2. motion through the air with wings.

The entry above has two definitions. Read the sentence below:

"The small bird could not fly."

This sentence uses __(how many?) definitions of "fly". **one (1)**

●

7-4 All the definitions of a word cannot be used in the same sentence. Read all the definitions of "horse" below:

horse (hôrs), 1. the animal shown in the picture. 2. a supporting frame. 3. a piece of gymnasium equipment.

"You can pet a horse and feed it sugar." This sentence uses definition number ___ of "horse". **one (1)**

●

7-5 horse (hôrs), 1. the animal shown in the picture. 2. a supporting frame. 3. a piece of gymnasium equipment.

Look at definition number 3 above. You do not pet or feed sugar to this kind of horse. A horse is also a piece of gymnasium __________ . **equipment**

●

7-6 horse (hôrs), 1. the animal shown in the picture. 2. a supporting frame. 3. a piece of gymnasium equipment.

"The carpenter put the board across a horse before he cut it." This sentence uses definition number ___ . **2.**

●

7-7 You use the dictionary to choose which __________ of a word has been used in the sentence. **definition**

●

STUDENTUTOR LIBRARY OF VOCABULARY ENRICHMENT
TECHNICAL STAFF, General Education, Inc.
GENERAL EDUCATION, INC.,
96 Mt. Auburn St., Cambridge 38, Mass.

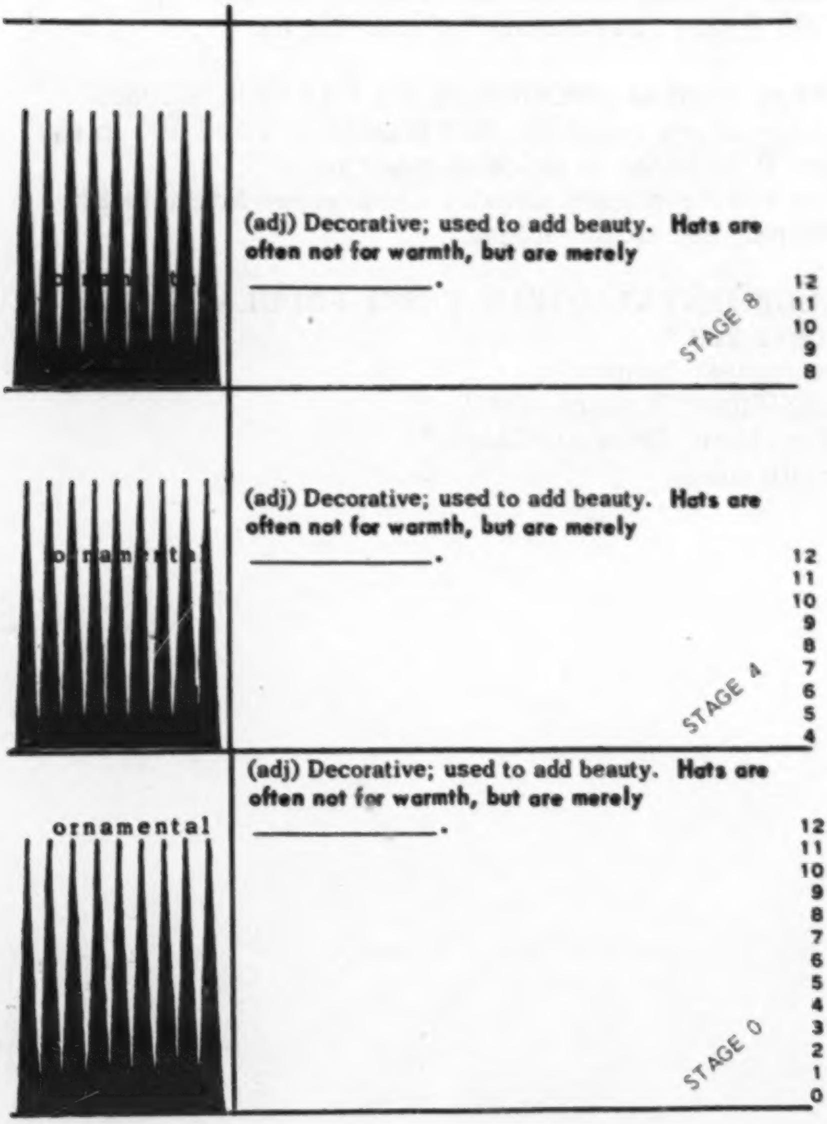
For use in STUDENTUTOR with Variprompter window, program reusable, 840 frames, programs supplied in kit which contains 5 machines and 18 scrolls. $45.00
Teacher's Manual available. Free with kit.
Table of Contents.
"Items in program may be used for diagnostic purposes."
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Materials are based on research studies reported in Israel, M. L., Variably Blurred Prompting: I. Methodology and Application to the Analysis of Paired-Associate Learning, The Journal of Psychology, 1960, 50, 43-52."
Average Time: 9 hours (est.).
Next Revision: Fall, 1963.
(1 sample page)

LANGUAGE ARTS

STUDENTUTOR LIBRARY OF VOCABULARY ENRICHMENT

Technical Staff; GENERAL EDUCATION
one sample page)



(adj) Decorative; used to add beauty. **Hats are often not for warmth, but are merely**
______________.

(adj) Decorative; used to add beauty. **Hats are often not for warmth, but are merely**
______________.

ornamental

(adj) Decorative; used to add beauty. **Hats are often not for warmth, but are merely**
______________.

STAGE 8
12 11 10 9 8
STAGE 4
12 11 10 9 8 7 6 5 4
STAGE 0
12 11 10 9 8 7 6 5 4 3 2 1 0

VOCABULARY BUILDING I and II
EMANUEL BIERMAN, Programer, assistant principal, Queens, N. Y.
ALEXANDER SCHURE, President, N. Y. Institute of Technology
Published by CENTRAL SCIENTIFIC COMPANY, 1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95; program not reusable, 500 frames in I and 500 in II, I or II included in price of machine.
Constructed Responses usually used; some Multiple Choice Responses; no Branching

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Over 200."
Prerequisites: None
Average Time: 3 hours (est.).
Next Revision: "Now available."
(1 sample page)

LANGUAGE ARTS

VOCABULARY BUILDING I and II
Bierman, Schure; CENTRAL SCIENTIFIC COMPANY
one sample page:

VOCABULARY BUILDING II

8. John's lethargic behavior convinced his mother he was ill. John was (spirited, sluggish, bored).

. . . .

sluggish

9. A synonym is a word that means the same as another word. A synonym for lethargic is (in a stupor, sorrowful).

. . . .

in a stupor

10. To be sluggish is to be ______________.

. . . .

lethargic

11. The original meaning of lethargic was forgetful. The greek work lēthē means______________.

. . . .

forgetfulness

12. To be homesick is to be ________________.
To be sluggish is to be ________________.

. . . .

nostalgic, lethargic

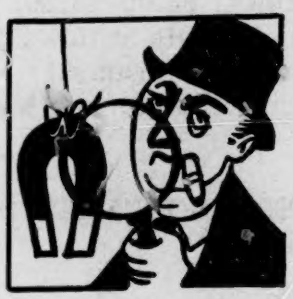
VOCABULARY GROWTH
Divide and Conquer Words
MARTA ZABORSKA, Programer, Learning Incorporated
JAMES COFFROTH, Instructor of Journalism and Publications, South Mountain High School, Phoenix, Arizona
Published by CORONET INSTRUCTIONAL FILMS,
65 E. So. Water Street, Chicago 1, Illinois.

Programed text, 339 frames, paperback, 57 pp., 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "...Small representative samplings at appropriate grade levels tested informally on one-to-one basis with programer. Small representative samplings under controlled conditions (Dukane Redi-tutor using 35 mm. film) for each revision of program. Program has been through 5 complete revisions, each revision based on data obtained from formal machine testing. Field testing in progress: Classroom testing from 8th through 12th grades, administered by classroom teachers. Test areas distributed geographically from Florida to California. All testing conducted by Learning Incorporated."
Other Using Population(s): "Subjects as low as grade 7."
Prerequisites:
Average Time: 2 hours, 18 minutes (based entirely on data); standard deviation, 32.8 minutes.
Next Revision: "The published program is the final revision."
(1 sample page)

LANGUAGE ARTS

VOCABULARY GROWTH
Zaborska, Coffroth; CORONET INSTRUCTIONAL FILMS
one sample page:



9-5 The *magnate* looked at the *magnet* with a *magnifying* glass. In this sentence the word which does not refer to greatness in any way is ___(?)___.	magnet
9-6 In the word *magnitude* the root meaning great is ____.	magn
9-7 *Magnitude* means _____ness.	greatness
9-8 *Magnitude* means size and importance, beside __(?)__ness.	greatness
9-9 *magnitude* = *size, greatness, importance* Write the meaning which fits best in the following phrases: a) a decision of great *magnitude* or ___(?)___. b) a building of great *magnitude* or ___(?)___. c) the *magnitude* or ___(?)___ of his generosity.	importance; size; greatness

WORD CLUES
Be a Word Detective
B. JEAN ANWYLL, Head Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.); program reusable, 200 frames, $2.00-$2.50. (Machine may be marketed in retail channels at this $20 combination price including 3 or 4 programs.)
Constructed Responses used sometimes; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

LANGUAGE ARTS

WORD CLUES
Anwyll; HONOR PRODUCTS COMPANY
one sample page:

In each example, the restatement was a clue to the meaning of the new words, and the restatement was found right after a ___________.	semicolon
You are now on your way to becoming a word detective. One clue that alerts a word detective is the ___________ because if often introduces a restatement.	semicolon
Sam's OOPAS set the class to laughing. An "OOPAS" is: a. an eight-legged animal. b. a musical instrument. c. There are not enough "clues" in the context to tell. Press and hold the button of your choice. Do not be disturbed if you skip some of the material.	a. "An eight-legged animal"? I'd say I caught you guessing!
Sam's OOPAS set the class to laughing. An "OOPAS" is: b. a musical instrument. c. There are not enough "clues" to tell. Press and hold the button of your choice.	b. "A musical instrument"? Remember, I made up the word "OOPAS." Are there really enough clues in the context to tell what it means?
An "OOPAS" is: b. a musical instrument. c. There are not enough "clues" to tell. Press and hold the button of your choice.	c. You're right! There aren't enough clues in the context to tell what "OOPAS" means.

WORD CLUES
Books G, H, I, J, K, L, and M
STANFORD E. TAYLOR, President, Educational Developmental Labs
HELEN FRACKENPOHL, Educational Developmental Labs
ARTHUR S. MCDONALD, Director of Reading Services, Marquette University
NANCY JOLINE, Staff Associate, Educational Developmental Labs
Published by EDUCATIONAL DEVELOPMENTAL LABORATORIES, Inc.,
284 Pulaski Road, Huntington, New York

Programed text, 310 frames (in each book), paperback, 176 pp., 8-1/2" x 11", $1.80.
Teacher's Manual available, $.30.
Index.
"Three equated tests are available which may be used as initial, medial, or final tests," $.25 per copy.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Schools in Milwaukee area and on Long Island."
Other using population(s): "Capable sixth grade students have used the seventh and eighth grade books."
Prerequisites: "Need to be reading on at least sixth grade level."
Average Time: 10-12 hours (est.).
Next Revision: 1-2 years.
(1 sample page)

LANGUAGE ARTS

WORD CLUES
Taylor, Frackenpohl, McDonald, Joline; EDUCATIONAL DEVELOPMENTAL LABORATORIES
one sample page:

Lesson 1: A Summer in Washington

Last summer I had a job in Washington, D.C., working in the office of our Representative to Congress. It was fascinating to be behind the scenes and see how our government functions. I often attended sessions of both the House of Representatives and the Senate. I actually met many of the men we hear about in the news........

An introductory frame sets the stage for the lesson to follow. Each of the ten words is then developed in three frames as follows:

1a

seethe (sēTH)

Washington that summer was *seething* with activity.

Write a definition or synonym:

FIRST FRAME

1b

In Washington two men may exchange friendly greetings and yet be inwardly *seething* with rage at one another.

Another word for *seethe* is:
........a. blush
........b. act
........c. boil
........d. talk

SECOND FRAME

c

1c

seethe (sēTH), **seethed, seeth ing. 1.** boil. **2.** bubble and foam: *Water seethed under the falls.* **3.** be excited; be disturbed. **4.** soak; steep. [OE *sēothan*] —Syn. **2.** See boil.

Check the sentence(s) in which *seethe* is used correctly.
........a. Please seethe the water for coffee.
........b. The trees were seething in the breeze.
........c. The water seethed as the waves crashed on the beach.
........d. The farmer asked me to seethe the field.

THIRD FRAME

c

(First frame for next word)

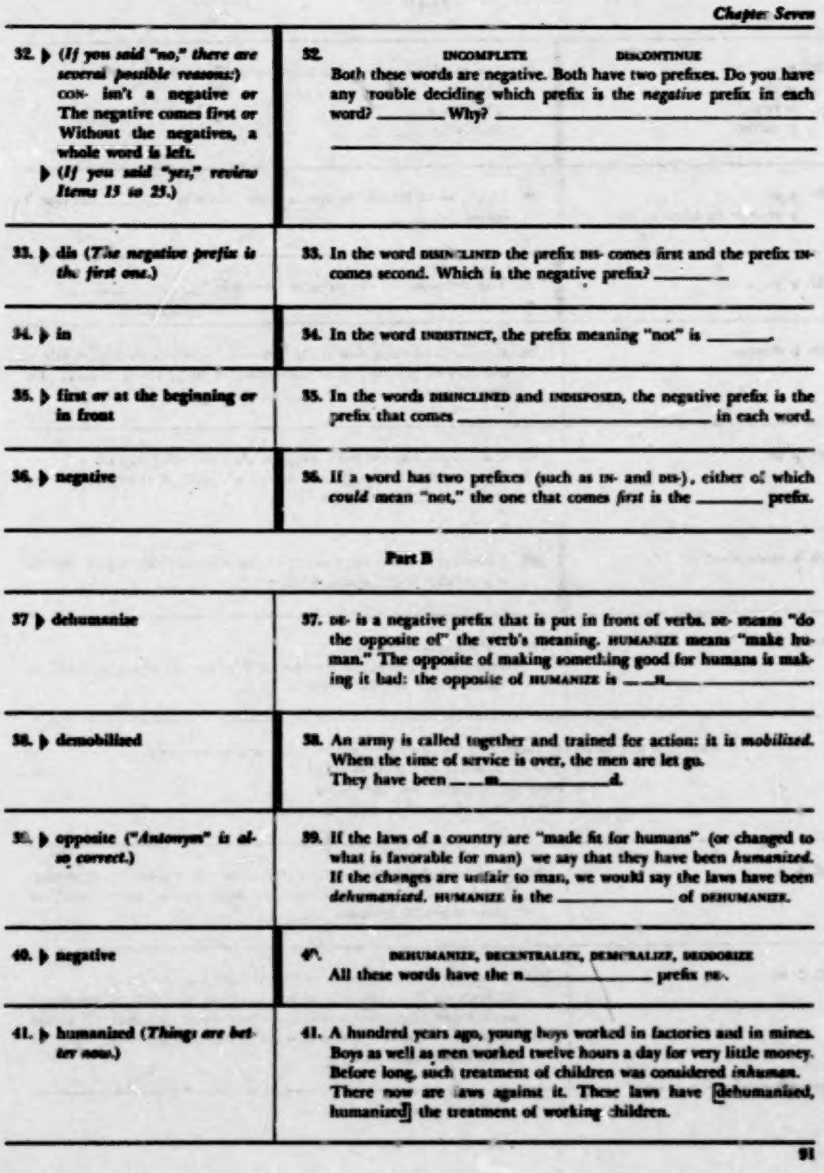
WORDS
A Programed Course in Vocabulary Development
SUSAN MEYER MARKLE, Education Dept., University of California at Los Angeles.
Published by SCIENCE RESEARCH ASSOCIATES, Inc., 259 East Erie Street, Chicago 11, Illinois.

Programed text, 2200 frames, paperback, 224 pp., 8 1/2" x 11", $1.40 (quantity discounts).
Teacher's Manual available, $.35, free with 25 or more Text booklets.
Table of Contents.
Unit, Final, Diagnostic Test(s) available.
Constructed Responses usually used; some Multiple Choice Responses; some Branching; some Double Tracking.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Grades 4-9"
Prerequisites:
Additional equipment required: (dictionary listing is a self-contained unit within the program.)
Average Time: 40 hours (based entirely on data).
Next Revision: September, 1965.
(2 sample pages)

LANGUAGE ARTS

WORDS
Markle; SCIENCE RESEARCH ASSOCIATES
2 sample pages:



Chapter Seven

32. ▶ *(If you said "no," there are several possible reasons:)* CON- isn't a negative *or* The negative comes first *or* Without the negatives, a whole word is left. ▶ *(If you said "yes," review Items 15 to 25.)*	32. INCOMPLETE DISCONTINUE Both these words are negative. Both have two prefixes. Do you have any trouble deciding which prefix is the *negative* prefix in each word? ______ Why? ________________________
33. ▶ dis *(The negative prefix is the first one.)*	33. In the word DISINCLINED the prefix DIS- comes first and the prefix IN- comes second. Which is the negative prefix? ______
34. ▶ in	34. In the word INDISTINCT, the prefix meaning "not" is ______.
35. ▶ first *or* at the beginning *or* in front	35. In the words DISINCLINED and INDISPOSED, the negative prefix is the prefix that comes ______________ in each word.
36. ▶ negative	36. If a word has two prefixes (such as IN- and DIS-), either of which *could* mean "not," the one that comes *first* is the ______ prefix.

Part B

37 ▶ dehumanize	37. DE- is a negative prefix that is put in front of verbs. DE- means "do the opposite of" the verb's meaning. HUMANIZE means "make human." The opposite of making something good for humans is making it bad: the opposite of HUMANIZE is _ _H__________.
38. ▶ demobilized	38. An army is called together and trained for action: it is *mobilized.* When the time of service is over, the men are let go. They have been _ _m__________d.
39. ▶ opposite *("Antonym" is also correct.)*	39. If the laws of a country are "made fit for humans" (or changed to what is favorable for man) we say that they have been *humanized.* If the changes are unfair to man, we would say the laws have been *dehumanized.* HUMANIZE is the __________ of DEHUMANIZE.
40. ▶ negative	40. DEHUMANIZE, DECENTRALIZE, DEMORALIZE, DEODORIZE All these words have the n__________ prefix DE-.
41. ▶ humanized *(Things are better now.)*	41. A hundred years ago, young boys worked in factories and in mines. Boys as well as men worked twelve hours a day for very little money. Before long, such treatment of children was considered *inhuman.* There now are laws against it. These laws have [dehumanized, humanized] the treatment of working children.

91

Part D

95. ▶ in ▶ dis ▶ pos ▶ suffix	**95.** The word INDISPOSED has four parts The first prefix is ______. The second prefix is ______. The root is ______. -ED is a __________.
96. ▶ in ▶ first or in front of DIS-	**96.** In the word INDISPOSED the negative prefix is ______, because it comes ______ ____________.
97. ▶ put away	**97.** The definition of the parts of DISPOSE is "______ ______."
98. ▶ dispose	**98.** Suppose something you no longer want is worth money. A sale is one way of getting rid of something, or of "*putting it away*" for good. You can ______p______ of something by selling it.
99. ▶ un	**99.** If an object has *not* been disposed of, it is UN*disposed* of. When DISPOSE means "throw away" or "sell," it is negated by the prefix ______, not by IN-.
100. ▶ undisposed of	**100.** A used car that has been sitting on the salesman's car lot for months is a car that is ___disposed of.
101. ▶ no	**101.** A newspaper headline says: PRESIDENT KENNEDY WAS INDISPOSED. Was anyone trying to "sell" or "throw away" Mr. Kennedy? ______

Note: Use this panel for Items 102-109 *(keep in view from No. 102 to No. 109)*.

A. The picture was still *undisposed of.*
B. President Kennedy was *indisposed.*
C. Henry was *indisposed to* accept my plan.

102. ▶ A	**102.** In each of the three sentences above, there is a negation of DISPOSE. In which of the sentences does the word DISPOSE mean "sold" or "thrown away"? Sentence ______
103. ▶ no	**103.** In Sentence A, UNDISPOSED OF means "not gotten rid of." In Sentence B, no one tries to get rid of Mr. Kennedy, so INDISPOSED can't mean "not gotten rid of." What about Sentence C? Could INDISPOSED TO mean "not gotten rid of" in that sentence? Would it make sense? ______

MODERN LANGUAGE H.S. and Coll.

ELEMENTARY FRENCH

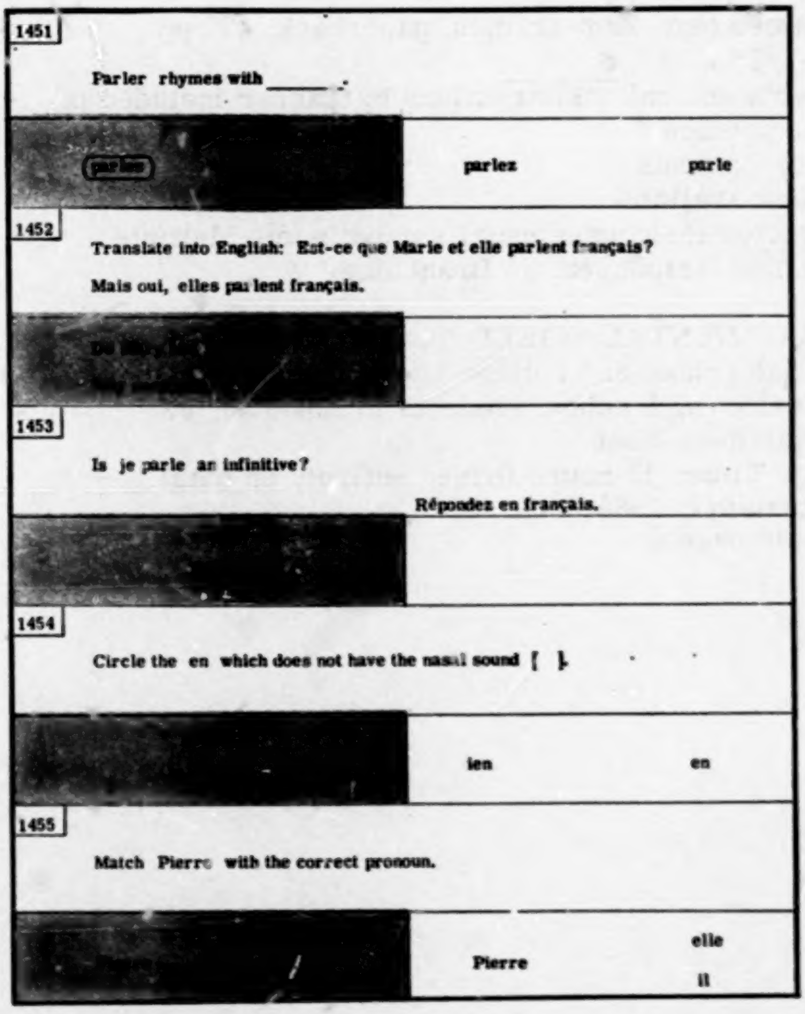
MARY K. RICKERT, Programer, General Programmed Teaching Corporation
BETTY LOU C. DUBOIS, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 2385 frames, paperback, 477 pp., 8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in the preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "High school and college students in Albuquerque, New Mexico; high school students in Roanoke, Va."
Prerequisites: None.
Average Time: 15 hours (based entirely on data).
Next Revision: 1968.
(2 sample pages)

MODERN LANGUAGE

ELEMENTARY FRENCH
Rickert, Dubois; ENCYCLOPAEDIA BRITANNICA PRESS
2 sample pages:



1451

Parler rhymes with ______.

[redacted] parlez parle

1452

Translate into English: Est-ce que Marie et elle parlent français?

Mais oui, elles parlent français.

[redacted]

1453

Is je parle an infinitive?

Répondez en français.

[redacted]

1454

Circle the en which does not have the nasal sound [ ].

[redacted] ien en

1455

Match Pierre with the correct pronoun.

[redacted] Pierre elle
il

1456

Substitute Pierre for il in the sentence: Il parle français.

[redacted]

_____________ parle français.

1457

To pronounce e in femme, gently place the tongue against the lower teeth, lower the jaw slightly and say at.
Practice this French sound [a] by repeating the words below.

[redacted]

ma
la
fa

1458

The French word parler means to speak.

Write to speak in French.

[redacted]

1459

Write in French without using est-ce que: Peter and my son are speaking English. Is she speaking English?

[redacted]

1460

The French word pronounced [par le] which means to speak is _________.

[redacted]

MODERN LANGUAGE Open

FRENCH (ELEMENTARY)
CLT French Series I (No. 16-12-03)
EDWARD M. STACK, Dept. of French, The American University, Washington, D.C.
Published by ELECTRONIC TEACHING LABORATORIES, 5034 Wisconsin Avenue, N.W., Washington 16, D.C.

For use in LANGUAGE LABORATORY, program reusable, 2340 frames, $79.95.
Teacher's Manual available, $1.25.
Table of Contents, Index.
Unit test (s), "integral part of program."
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: Minimum requirement: tape recorder.
Average Time: 10 hours (est.).
Next Revision:
(1 sample page)

MODERN LANGUAGE

FRENCH (ELEMENTARY)
Stack; ELECTRONIC TEACHING LABORATORIES
one sample page:

SAMPLE FRAMES (from tapescript) CLT French (Series I)

1. STIMULUS La femme est intelligente. Et l'homme ?

   RESPONSE (timed pause for student answer)

   MASTER L'homme est intelligent.
   ↕
   REINFORCEMENT (timed pause for repetition)

2. STIMULUS La jeune fille est charmante. Et le garçon ?

   RESPONSE (timed pause for student answer)

   MASTER Le garçon est charmant.

   REINFORCEMENT (timed pause for repetition)

FRENCH I
Short-Cut in Vocabulary Building
OGUZ R. TURKKAN, President of LFI
Mrs. J. BOUCHER, Consultant, Board of Education, N.Y.C.
Published by LEARNING FOUNDATIONS INSTITUTE, Inc.
271 North Avenue, New Rochelle, N.Y.

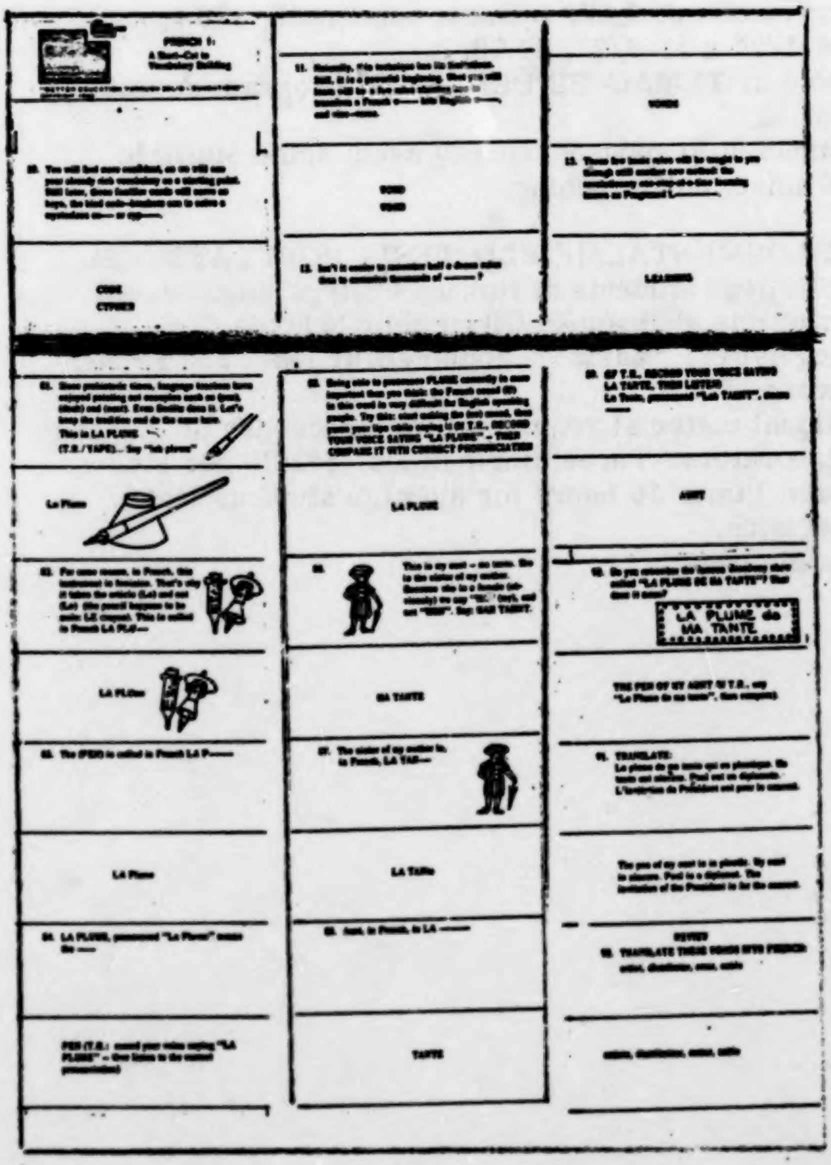
For use in	LEARNATRON MK II	$495.00
	A/Z MARK I AND II	$89-189
	THE MINIK	$4.95-14.75

Program reusable, 106 frames, $2.00-20.00
Table of Contents.
Unit and Final Test(s) available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "International Camp and Children's Colony (Lakeville, Conn.): advanced students and teachers' training camp."
Other using population(s): Adult beginners.
Prerequisites:
Average Time: 2 hours (est.).
Additional Material required: "Tape Recorder desirable, not necessary; (we supply a Transistorized Tape Recorder - The "Miny."
Next Revision: 1964.
(1 sample page)

MODERN LANGUAGE

FRENCH I
Turkkan, Boucher; LEARNING FOUNDATIONS INSTITUTE
one sample page:



LA PLUME de MA TANTE

FRENCH PHONETICS

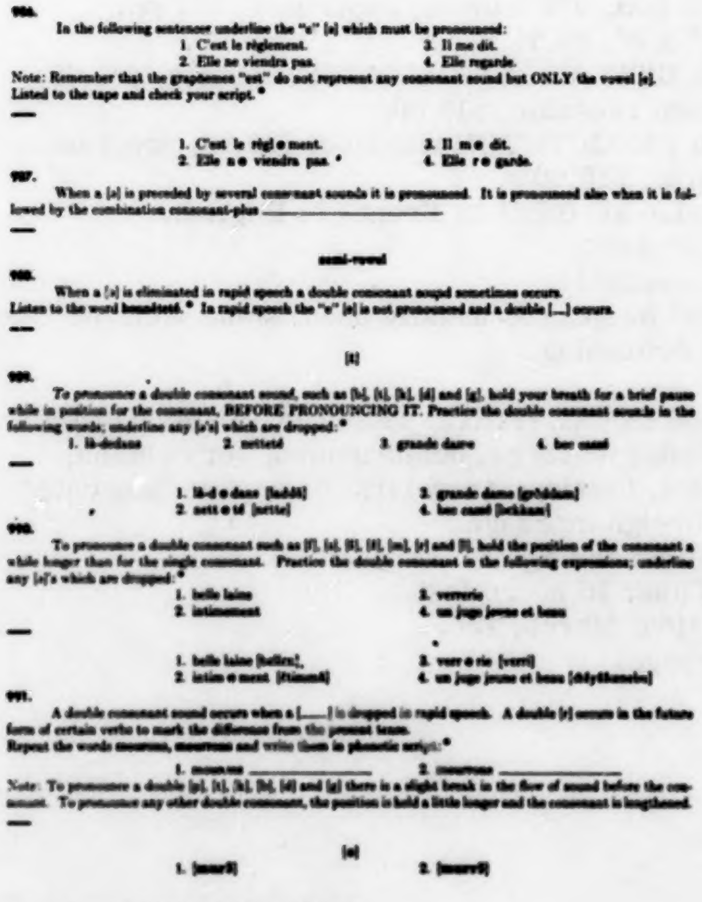
ELIANE BURROUGHS, French Dept., Hollins College
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1,000 frames, paperback, 170 pp., 8-1/2" x 11-1/2", $7.70.
For use in TEMAC BINDER, $1.75; program reusable, $5.95.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "College students at Hollins College; high school students at Roanoke City Public Schools."
Prerequisites: "Basic vocabulary of at least 300 French words."
Additional material required: Tape recorder or language laboratory. Three single tapes—$42.30 per set.
Average Time: 16 hours for average students (est.).
No Revision.
(1 sample page)

MODERN LANGUAGE

FRENCH PHONETICS
Burroughs; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



906.

In the following sentences underline the "e" [ə] which must be pronounced:

1. C'est le règlement.
2. Elle ne viendra pas.
3. Il me dit.
4. Elle regarde.

Note: Remember that the graphemes "est" do not represent any consonant sound but ONLY the vowel [ɛ].
Listed to the tape and check your script.*

—

1. C'est le règl e ment.
2. Elle n e viendra pas.*
3. Il m e dit.
4. Elle r e garde.

907.

When a [ə] is preceded by several consonant sounds it is pronounced. It is pronounced also when it is followed by the combination consonant-plus ____________

—

semi-vowel

908.

When a [ə] is eliminated in rapid speech a double consonant sound sometimes occurs.
Listen to the word [illegible].* In rapid speech the "e" [ə] is not pronounced and a double [...] occurs.

—

[t]

909.

To pronounce a double consonant sound, such as [b], [t], [k], [d] and [g], hold your breath for a brief pause while in position for the consonant, BEFORE PRONOUNCING IT. Practice the double consonant sounds in the following words; underline any [ə's] which are dropped:*

1. là-dedans
2. netteté
3. grande dame
4. bec cassé

—

1. là-d e dans [illegible]
2. nett e té [illegible]
3. grande dame [illegible]
4. bec cassé [illegible]

910.

To pronounce a double consonant such as [f], [s], [ʃ], [l], [m], [r] and [ʒ], hold the position of the consonant a while longer than for the single consonant. Practice the double consonant in the following expressions; underline any [ə]'s which are dropped:*

1. belle laine
2. intimement
3. verrerie
4. un juge jeune et beau

—

1. belle laine [illegible],
2. intim e ment [illegible]
3. verr e rie [illegible]
4. un juge jeune et beau [illegible]

911.

A double consonant sound occurs when a [____] is dropped in rapid speech. A double [r] occurs in the future form of certain verbs to mark the difference from the present tense.
Repeat the words [illegible], [illegible] and write them in phonetic script:*

1. [illegible] ____________
2. [illegible] ____________

Note: To pronounce a double [p], [t], [k], [b], [d] and [g] there is a slight break in the flow of sound before the consonant. To pronounce any other double consonant, the position is held a little longer and the consonant is lengthened.

—

[ə]

1. [illegible]
2. [illegible]

Programmed Student Manual for French Phonetics

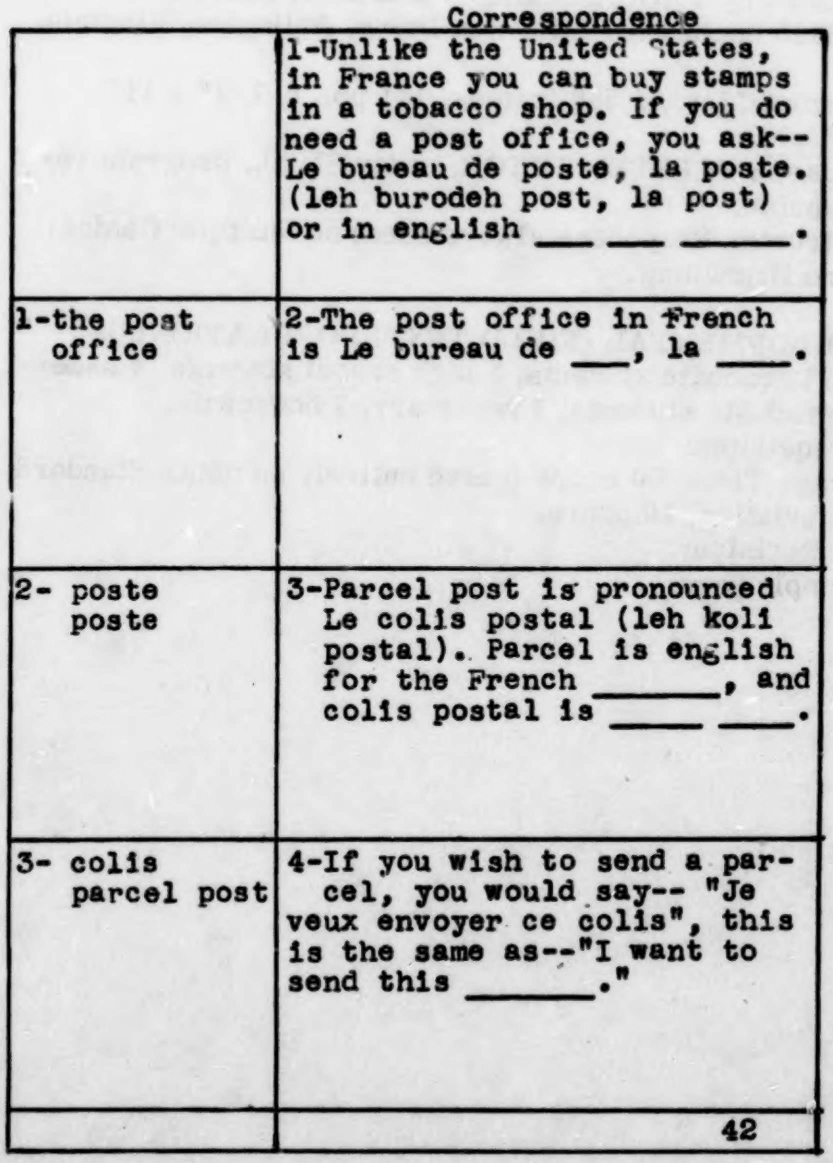
FRENCH TRAVATUTOR
JAC D. MEACHAM, Director, Universal Learning Division
JOHN V. GORMLEY, Instructor
JEAN FREMONT, Instructor
Published by GRAFICROLL SYSTEMS, Inc.
4215 Calavo Drive, La Mesa, California

Programed text, 975 frames, paperback, 242 pp., 5 1/2" x 8", $9.95.
For use in DISCOVERY COLUMBUS machine, $38.75; program reusable, $15.00.
For use in EXECUTUTOR machine, $29.95; program reusable, $15.00
Program also available in French to English.
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Students, teachers, businessmen, servicemen, families, tourists, travelers, or anyone interested in a foreign language."
Prerequisites: None
Average Time: 10 hours (est.).
Next Revision: March, 1963.
(1 sample page)

MODERN LANGUAGE

FRENCH TRAVATUTOR
Meacham, Gormley, Fremont; GRAFICROLL SYSTEMS
one sample page:



	Correspondence
	1-Unlike the United States, in France you can buy stamps in a tobacco shop. If you do need a post office, you ask--Le bureau de poste, la poste. (leh burodeh post, la post) or in english ___ ___ ______.
1-the post office	2-The post office in French is Le bureau de ___, la ____.
2- poste poste	3-Parcel post is pronounced Le colis postal (leh koli postal). Parcel is english for the French _______, and colis postal is _____ ____.
3- colis parcel post	4-If you wish to send a parcel, you would say-- "Je veux envoyer ce colis", this is the same as--"I want to send this _______."
	42

MODERN LANGUAGE **H.S.-Coll.**

BASIC GERMAN VOCABULARY
HALMUTH H. SCHAEFER
CHARLES B. FERSTER, both of Institute for Behavioral Research
Published by PROGRAMMED TEACHING AIDS, Inc.
3810 South Four Mile Run Drive, Arlington, Virginia.

Programed text, 1,586 frames, 131 pp., 8 1/2" x 11". $3.00.
For use in FERSTER TUTOR, under $5.00., program reusable.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
27 graduate students, 3 high school students, 4 undergraduate students, 1 secretary, 1 housewife.
Prerequisites:
Average Time: 50 hours (based entirely on data). Standard deviation, 10 hours.
Next Revision:
(1 sample page)

MODERN LANGUAGE

BASIC GERMAN VOCABULARY
Schaefer, Ferster; PROGRAMMED TEACHING AIDS
one sample page:

1. It takes a Knabe and a girl to fall in love.	boy
2. When Washington was a little Knabe he lied.	boy
3. When I was a little ____ I wore knee pants.	Knabe
4. Snipe and snails and puppy dogs' tails, that's what a little ____ is made of.	Knabe
5. boy = ____	Knabe
499. "Those awful Blumen!" said Hans who had hayfever. "Sie sind schöne Blumen, not awful at all!" said *his Schwester who had no hayfever.*	...flowers...They are beautiful flowers... sister
500. "Du bist ein schöner Wissenschaftler!" said the General full of sarcasm to his rocket expert. DON'T WRITE ANYTHING FOR THIS FRAME	
501. "Du bist ein schöner Student, getting all F's." MAYBE YOU SEE IT NOW, BUT DON'T WRITE ANYTHING DOWN YET	
502. A famous sarcastic line from Gilbert and Sullivan is: "What a schöner state of things!"	...pretty...
503. Translate as far as you can: "Some student you are, getting all F's."	Du bist ein schöner Student

MODERN LANGUAGE Jr. H.S.-Coll.+

GERMAN A

DR. ERNEST E. ELLERT, Colorado State University
Published by ENCYCLOPAEDIA BRITANNICA PRESS
425 North Michigan Avenue, Chicago 11, Illinois

Programed text, 5,050 frames, paperback, 8 1/2" x 11 1/2", $33.75. Bound in 10 seperate sections.
For use in TEMAC BINDER, $1.75; program reusable, $32.00.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Students at Hollins College and Roanoke Public Schools."
No special prerequisites.
Additional material required: Tape recorder or language laboratory and tapes accompanying the program.
Price of tapes - $115.00 for a set of 12
Average Time: 120 classroom hours (est.).
No Revision.
(1 sample page)

MODERN LANGUAGE

GERMAN A
Ellert; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:

1.

The words of a language are combinations of sounds. When you speak English, you use English sounds. When you speak German, you will use German ....

---

sounds

2.

German and English are related languages. Thus they have many similar sounds. But they also have some ... sounds.

---

different

3.

The sounds of English are divided into two groups: vowels and consonants. The sounds of German are also divided into ... and ....

---

vowels consonants

4.

We use the letters of the alphabet to represent English sounds. We will use the same letters to represent German vowels that we do to represent English ....

---

vowels

But these letters ... (will/will not) always represent the same sounds that they do in English.

---

will not

German A **1**

MODERN LANGUAGE Open

GERMAN TRAVATUTOR
JAC D. MEACHAM, Director, Universal Learning Division,
RUTH H. COOVER, Instructor
MARIANNE C. BUSCH, Instructor
Published by GRAFICROLL SYSTEMS, Inc.
4215 Calavo Drive, La Mesa, California

Programed text, 1010 frames, paperback, 247 pp., 5 1/2" x 8", $9.95.
For use in DISCOVERY COLUMBUS machine, $38.75; program reusable, $15.00.
For use in EXECUTUTOR machine, $29.95; program reusable, $15.00.
Program also available in German to English.
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Students, teachers, businessmen, servicemen, families, tourists, travelers, or anyone interested in a foreign language."
Prerequisites: None
Average Time: 10 hours (est.).
Next Revision: March, 1963.
(1 sample page)

MODERN LANGUAGE

GERMAN TRAVATUTOR
Meacham, Coover, Busch; GRAFICROLL SYSTEMS
one sample page:

Pronounciation

	1- The letter a in english is pronounced eight (8) different ways. In German we are concerned with only two types of sounds. The LONG a and the SHORT a. The long a is one of the ___ German sounds for the letter a.
1 two (2)	2- The long a in German can also be spelled aa or ah. The long a in German is pronounced like the a in father and the a in Dame (lady), haben (have), Haar (hair) in the ______ language.
2 German	3- The SHORT a in German is the sound of aah as in pot or like the a in artistic. The sound of the short a in German is like: Mann (man) Anna (Anne), Ball (ball), and das (the). The _____ a is quicker in sound than in the long a.
3 short	4- The German language, unlike the english, has only ____ types of sounds for the letter a. The _____ and the _____ a.
	5

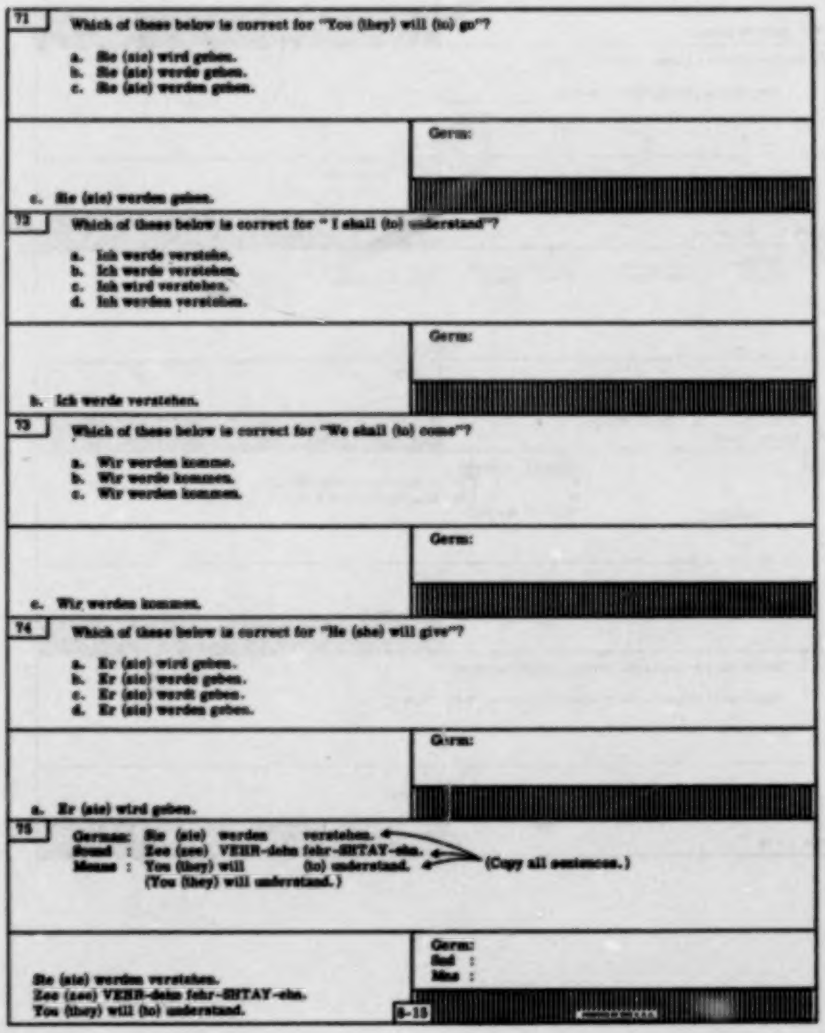
MODERN LANGUAGE SERIES - BASIC GERMAN READING
DONALD TOSTI
NIRAM A. WILSON, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 3,643 frames, paperback, 740 pp., 8 1/2" x 11", bound in 3 separate volumes, $16.00.
For use in MIN/MAX II machine, $25.00; program reusable, $15.00.
Teacher's Manual: General Manual for all TMI-Grolier programs available.
Final Test included.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Thirteen year olds through adults."
Prerequisites: "Requires ability to read and follow simple instructions in English."
Average Time: 17-30 hours (based entirely on data); standard deviation, 3.5 hours.
Next Revision: June, 1963.
(3 sample pages)

MODERN LANGUAGE

MODERN LANGUAGE SERIES - BASIC GERMAN READING
Tosti, Wilson; TEACHING MATERIALS CORPORATION
3 sample pages:



71 Which of these below is correct for "You (they) will (to) go"?

a. Sie (sie) wird geben.
b. Sie (sie) werde geben.
c. Sie (sie) werden geben.

Germ:

c. Sie (sie) werden geben.

72 Which of these below is correct for " I shall (to) understand"?

a. Ich werde verstehe.
b. Ich werde verstehen.
c. Ich wird verstehen.
d. Ich werden verstehen.

Germ:

b. Ich werde verstehen.

73 Which of these below is correct for "We shall (to) come"?

a. Wir werden komme.
b. Wir werde kommen.
c. Wir werden kommen.

Germ:

c. Wir werden kommen.

74 Which of these below is correct for "He (she) will give"?

a. Er (sie) wird geben.
b. Er (sie) werde geben.
c. Er (sie) werdt geben.
d. Er (sie) werden geben.

Germ:

a. Er (sie) wird geben.

75
German: Sie (sie) werden verstehen.
Sound : Zee (zee) VEHR-dehn fehr-SHTAY-ehn.
Means : You (they) will (to) understand.
(You (they) will understand.)
(Copy all sentences.)

Germ:
Snd :
Mns :

Sie (sie) werden verstehen.
Zee (zee) VEHR-dehn fehr-SHTAY-ehn.
You (they) will (to) understand.

8-15

106

German: Wie ____ ____ ____? ← (Copy German and fill in what is missing.)
Means : How goes it (with) you?
(How are you?)

Germ:

Wie (geht es Ihnen)?

107

The German words "geht es" mean ________ ____.

The German word "Ihnen" means ______ _____.

Mns: __________
____

goes it (with) you

108

German: 1. ________ 2. ____________ 3. ____________
Means : 1. Good day. 2. Good morning. 3. Good evening.

Germ: 1.
2.
3.

1. Guten Tag. 2. Guten Morgen.
3. Guten Abend.

109

German = Sound
w = v ("w" is always sounded "v" as in "very.")
ie = ee ("ie" is always sounded "ee" as in "see.")
"wie" is sounded __________.

Snd:

vee

110

Which word below is the correct sound for "how"?

Which word below is the correct German word for "how"?

hoe vee wie

Snd :
Germ:

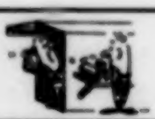
vee wie

1-23

86

German: ______________

Means : He (she) name Schmidt.
(His (her) name is Schmidt.)



Er (sie) heißt Schmidt.

Germ:

87

German: 1. Wir heißen Koch. 2. Heißen sie Müller?
Means : ______________ ______________

1. We name Koch. (Our name is Koch.)
2. Name they Müller? (Is their name Müller?)

Mns: 1.
2.

88

German: ______________ ______________
Means : 1. We name Koch. 2. Name they Müller?
(Our name is Koch.) (Is their name Müller?)

1. Wir heißen Koch.
2. Heißen sie Müller?

Germ: 1.
2.

89

German: 1. Ich muß gehen. 2. Er (sie) muß sehen.
Means : ______________ ______________

1. I must (to) go. (I must go.)
2. He (she) must (to) see.
(He (she) must see.)

Mns: 1.
2.

90

German: ______________ ______________
Means : 1. I must (to) go. 2. He (she) must (to) see.
(I must go.) (He (she) must see.)

1. Ich muß gehen.
2. Er (sie) muß sehen.

Germ: 1.
2.

23-18

MODERN LANGUAGE SERIES: MODERN HEBREW: BASIC READING
RABBI MAX LEADER
DONALD BERTHOLOMEY, Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York.

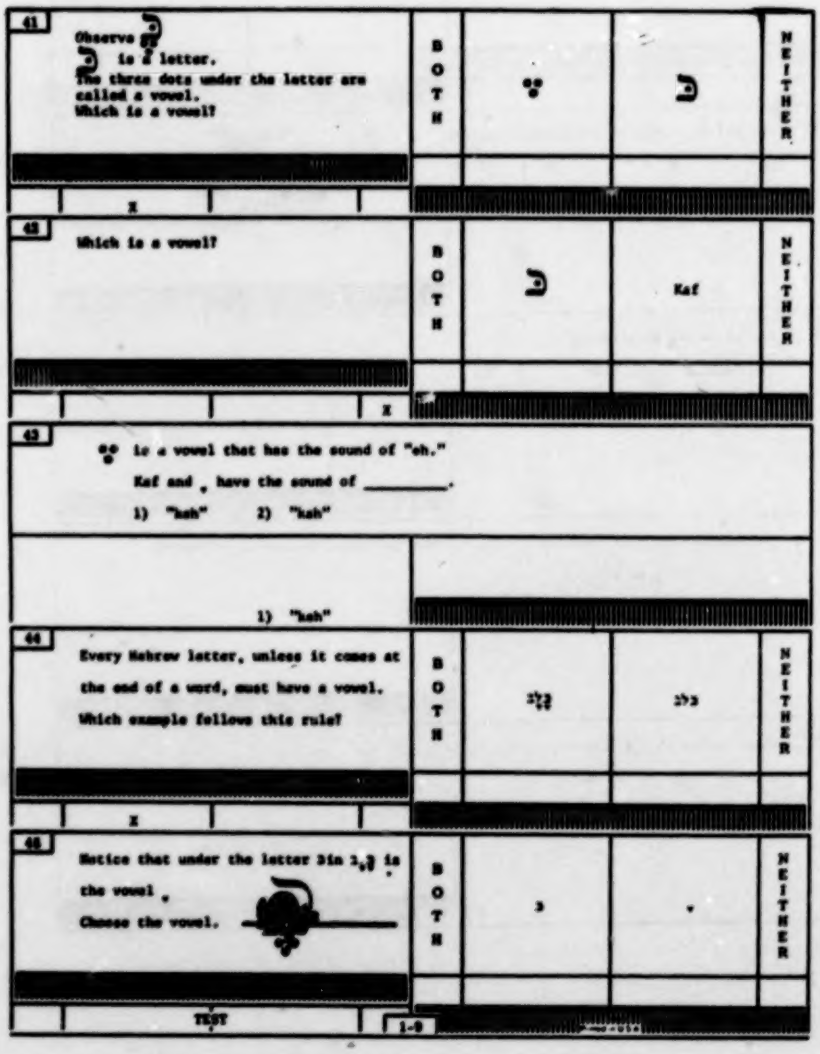
Programed text, 2,541 frames, paperback, 528 pp., 8 1/2" x 11", bound in 2 separate units, $16.00.
For use in MIN/MAX II machine, $25.00; program reusable, $15.00.
Teacher's Manual: General Manual for all TMI-Grolier programs available.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "8-15 year olds, 3-10th grade students."
Prerequisites: "Requires an ability to read and write elementary English."
Average Time: 17-25 hours (based entirely on data); standard deviation, 2.63 hours.
Next Revision: July, 1963.
(2 sample pages)

MODERN LANGUAGE

MODERN LANGUAGE SERIES: MODERN HEBREW: BASIC READING

Leader, Bertholomey; TEACHING MATERIALS CORP.
2 sample pages:



41
Observe כֶּ
כּ is a letter.
The three dots under the letter are called a vowel.
Which is a vowel?

BOTH	ֶ	כּ	NEITHER

X

42
Which is a vowel?

BOTH	כּ	Kaf	NEITHER

X

43
ֶ is a vowel that has the sound of "eh."
Kaf and ֶ have the sound of ________.
1) "keh" 2) "kah"

1) "keh"

44
Every Hebrew letter, unless it comes at the end of a word, must have a vowel.
Which example follows this rule?

BOTH	כֶּלֶב	כלב	NEITHER

X

45
Notice that under the letter כ in כֶּלֶב is the vowel ֶ.
Choose the vowel.

BOTH	כ	ֶ	NEITHER

TEST
1-9

81

Which is Vet?

BOTH	ב	ל	NEITHER

X

82

Vet has the sound of the English letter:

1) l 2) k 3) eh 4) v

TEST

83

How would you pronounce בֶ?

1) "veh" 2) "leh" 3) "eh" 4) "kah"

1) "veh"

84

בֶ is pronounced "veh" because a Hebrew letter is always pronounced before the _______ that goes with it.

vowel

85

Which letter in לֵבָב does not have a vowel?

1) ב 2) ל 3) ב

3)

1-17

MODERN LANGUAGE **Open**

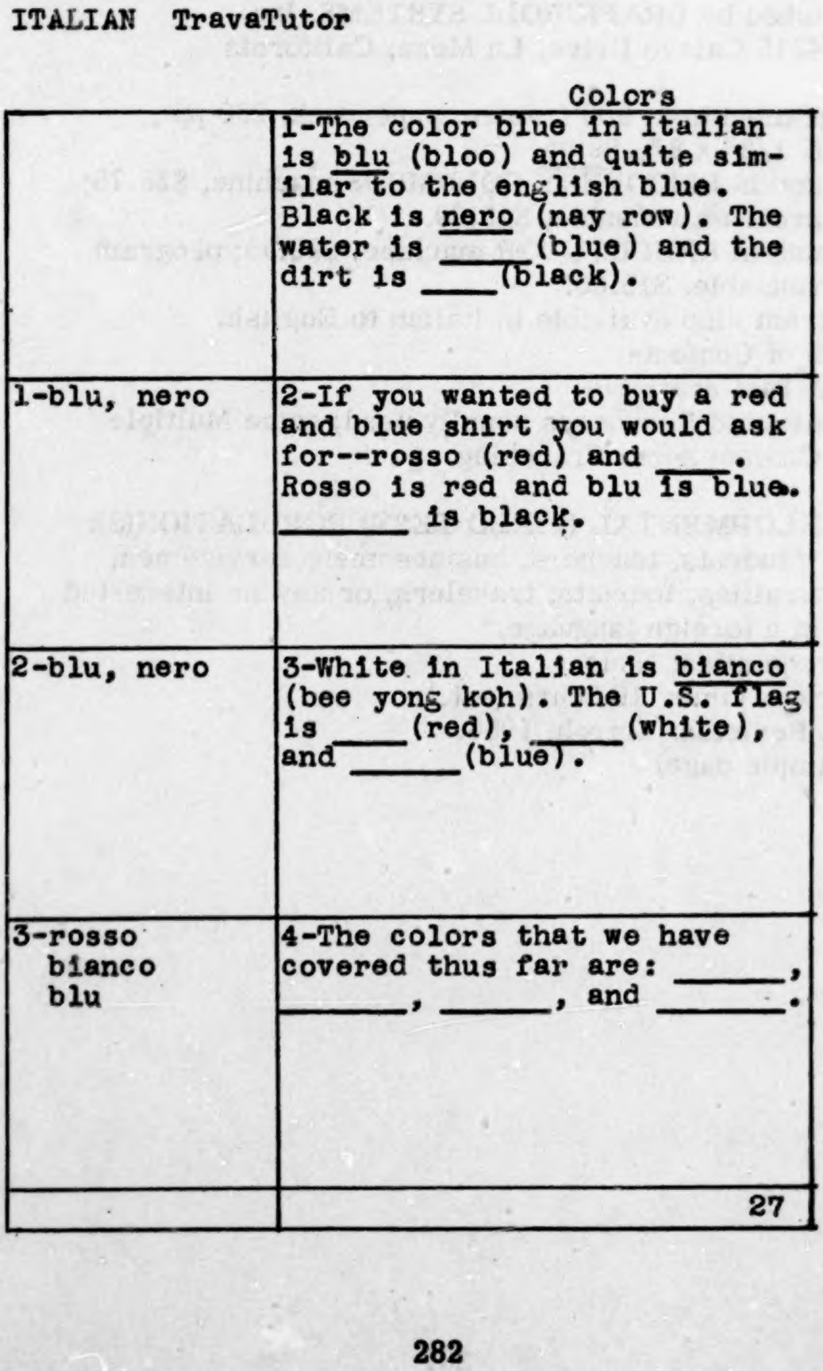
ITALIAN TRAVATUTOR
JAC D. MEACHAM, Director, Universal Learning Division
JOSEPHINE REID, Instructor
Published by GRAFICROLL SYSTEMS, Inc.,
4215 Calavo Drive, La Mesa, California

Programed text, 900 frames, paperback, 230 pp., 5 1/2" x 8", $9.95.
For use in DISCOVERY COLUMBUS machine, $38.75; program reusable, $15.00.
For use in EXECUTUTOR machine, $29.95; program reusable, $15.00.
Program also available in Italian to English.
Table of Contents.
Final Test available.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Students, teachers, businessmen, servicemen, families, tourists, travelers, or anyone interested in a foreign language."
Prerequisites: None.
Average Time: 10 hours (est.).
Next Revision: March, 1963.
(1 sample page)

MODERN LANGUAGE

ITALIAN TRAVATUTOR
Meacham, Reid; GRAFICROLL SYSTEMS
one sample page:



ITALIAN TravaTutor

Colors

	1-The color blue in Italian is blu (bloo) and quite simílar to the english blue. Black is nero (nay row). The water is ____ (blue) and the dirt is ____(black).
1-blu, nero	2-If you wanted to buy a red and blue shirt you would ask for--rosso (red) and ____. Rosso is red and blu is blue. ______is black.
2-blu, nero	3-White in Italian is bianco (bee yong koh). The U.S. flag is ____(red), _____(white), and ______(blue).
3-rosso bianco blu	4-The colors that we have covered thus far are: ______, ______, ______, and ______.
	27

MODERN LANGUAGE Open

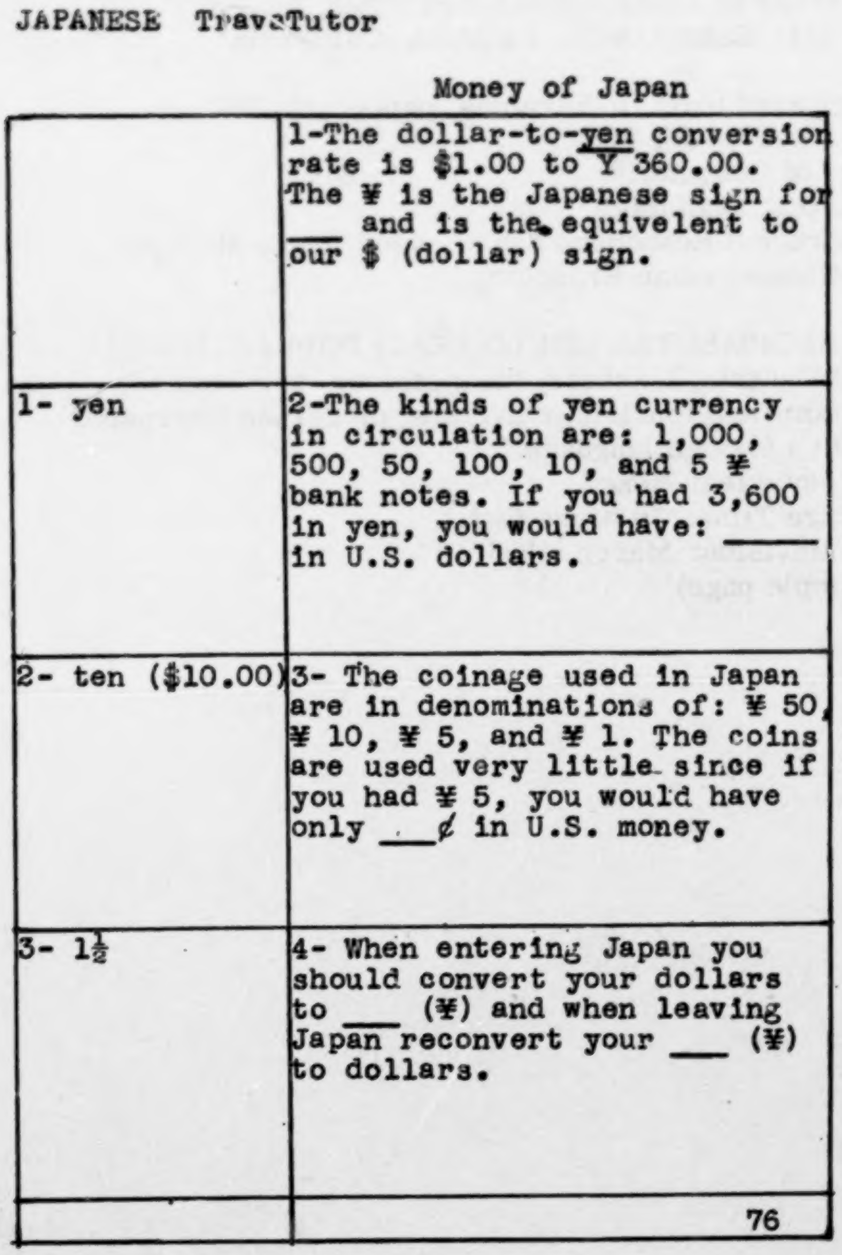
JAPANESE TRAVATUTOR
JAC D. MEACHAM, Director, Universal Learning Division
YASUKO KAJII, Instructor
Published by GRAFICROLL SYSTEMS, Inc.,
4215 Calavo Drive, La Mesa, California

Programed text, 1075 frames, paperback, 263 pp., 5 1/2" x 8", $9.95.
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Students, teachers, businessmen, servicemen, families, tourists, travelers, or anyone interested in a foreign language."
Prerequisites: None
Average Time: 10 hours (est.).
Next Revision: March, 1963.
(1 sample page)

MODERN LANGUAGE

JAPANESE TRAVATUTOR
Meacham, Kajii; GRAFICROLL SYSTEMS
one sample page:



JAPANESE TravaTutor

Money of Japan

	1-The dollar-to-yen conversio rate is $1.00 to Y 360.00. The ¥ is the Japanese sign fo ___ and is the equivelent to our $ (dollar) sign.
1- yen	2-The kinds of yen currency in circulation are: 1,000, 500, 50, 100, 10, and 5 ¥ bank notes. If you had 3,600 in yen, you would have: _____ in U.S. dollars.
2- ten ($10.00)	3- The coinage used in Japan are in denominations of: ¥ 50, ¥ 10, ¥ 5, and ¥ 1. The coins are used very little since if you had ¥ 5, you would have only ___¢ in U.S. money.
3- 1½	4- When entering Japan you should convert your dollars to ___ (¥) and when leaving Japan reconvert your ___ (¥) to dollars.
	76

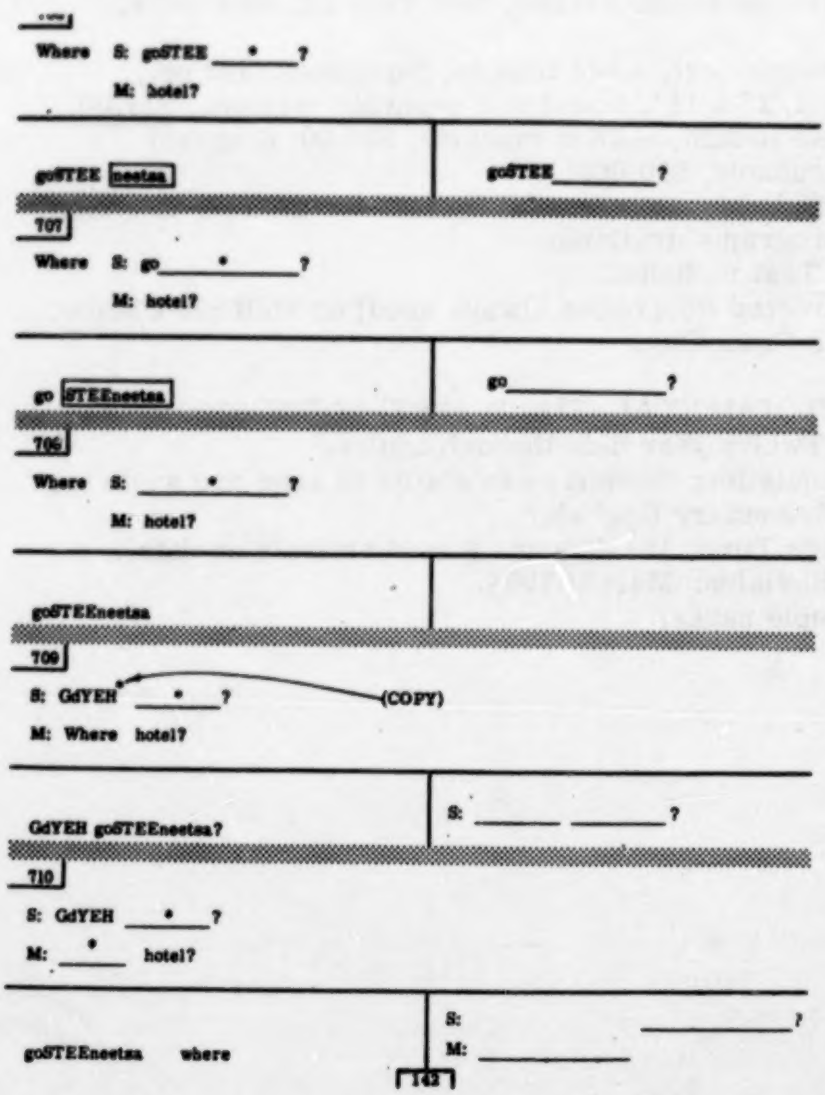
MODERN LANGUAGE SERIES: BASIC RUSSIAN READING
LLOYD E. HOMME
NIRAM A. WILSON, both of Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York.

Programed text, 1,994 frames, paperback, 402 pp.,
8 1/2" x 11", bound in 2 separate volumes, $11.00.
For use in MIN/MAX II machine, $25.00; program
reusable, $10.00.
Teacher's Manual: General Manual for all TMI-Grolier
programs available.
Final Test included.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Twelve year olds through adults."
Prerequisites: "Requires an ability to read and write
elementary English."
Average Time: 18-20 hours (based entirely on data).
Next Revision: March, 1964.
(2 sample pages)

MODERN LANGUAGE

MODERN LANGUAGE SERIES: BASIC RUSSIAN READING
Homme, Wilson; TEACHING MATERIALS CORPORATION
2 sample pages:



Where S: goSTEE ___•___?

M: hotel?

goSTEE neetsa | goSTEE________?

707

Where S: go______•______?

M: hotel?

go STEEneetsa | go____________?

708

Where S: ______•______?

M: hotel?

goSTEEneetsa

709

S: GdYEH ___•___? (COPY)

M: Where hotel?

GdYEH goSTEEneetsa? | S: ______ ______?

710

S: GdYEH ___•___?

M: ___•___ hotel?

goSTEEneetsa where | S: ____________? M: ____________

142

1691

R:

M: Do they speak Russian?

Они говорят по-русски?

1692

R:

M: No, they speak very little.

Нет, они говорят очень мало.

1693

R:

M: I shall read. I shall read the book.

Я буду читать. Я буду читать книгу.

1694

R:

M: He will speak. He will speak Russian.

Он будет говорить. Он будет говорить по-русски.

1695

R: Они будут говорить по-русски.

M:

They will speak Russian.

339

MODERN LANGUAGE Jr. H.S.-Coll.+

WRITING RUSSIAN SCRIPT
A Self-Instructional Program.
IRVING J. SALTZMAN, Dept. of Psychology, Indiana University
Published by McGRAW-HILL BOOK COMPANY, Inc.,
330 West 42nd Street, New York City.

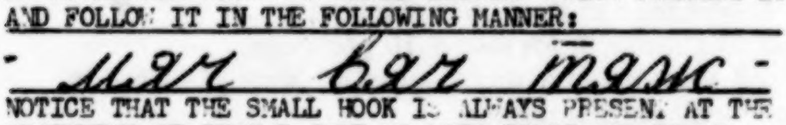
Programed text, 2,000 frames, papercover, 400 pp., 8 1/2" x 11", $3.95.
Table of Contents.
Final Test included.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "High school and college students, adults."
Prerequisites: "Must be able to read and write English."
Additional equipment required: "Tape recorder and taped material, optional."
Average Time: 10.5 hours plus 1.5 hours on tape (est.).
Next Revision:
(1 sample page)

MODERN LANGUAGE

WRITING RUSSIAN SCRIPT
Saltzman; McGRAW-HILL BOOK COMPANY
one sample page:

S224: IN RUSSIAN SCRIPT, THE SMALL LETTER "YAH" (я) IS CONNECTED WITH THE SMALL LETTERS WHICH PRECEDE IT AND FOLLOW IT IN THE FOLLOWING MANNER:

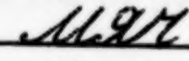
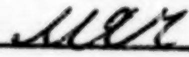


NOTICE THAT THE SMALL HOOK IS ALWAYS PRESENT AT THE BEGINNING OF "YAH," JUST AS WITH "ELL" AND "EM."

* * *

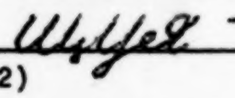
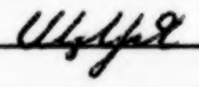
From each of the following pairs, select the item indicated, check your response and then make a copy of the correct item.

Q1-224: мяч in script.

1) –  – 2) –  –

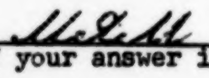
A1-224 1)

Q4-224: шуя in script.

1) –  – 2) –  –

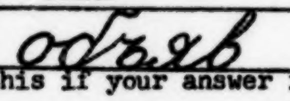
A4-224: 2)

Q6-224: Write: мям

A6-224: –  –

Copy this if your answer is wrong.

Q7-224: Write: объяв

A7-224: –  –

Copy this if your answer is wrong.

R-Q1: Are the following letters in their correct alphabetical order: ч ш щ ъ ы ь э ю я

R-A1: Yes.

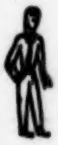
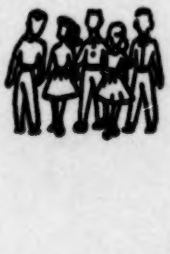
AUTOMATED SPANISH
DELBERT L. BARCUS, Supervising Teacher, Denver Public Schools.
Published by DENVER PUBLIC SCHOOLS,
414 14th Street, Denver 1, Colorado

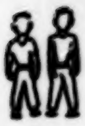
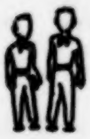
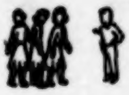
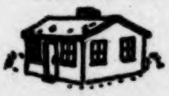
Programed text, 2016 frames, paperback, 291 pp., 8-1/2" x 11", 3 separate units @ $1.50 each.
Final Test available, 2 forms, $.10 per copy.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "6 to 20 individual trials preliminary to research study using 6000 sixth graders in the Denver Public Schools."
Prerequisites: "Fifty to seventy-five hours of audio-lingual training in Spanish."
Average Time: 21,039 hours (based entirely on data with a standard deviation of 4,926 hours).
Next Revision:
(2 sample pages)

MODERN LANGUAGE

AUTOMATED SPANISH
Barcus; DENVER PUBLIC SCHOOLS
2 sample pages:

245. señora	246. Este se__ es alto y flaco.	
246. señor	247. José tiene dos hermanos. Uno se llama Alberto; uno s_ ll___ Federico.	
247. se llama	248. Alberto no tiene hermanas. Alberto t______ hermanos.	
248. tiene	249. ¿Cuántos hermanos tiene Alberto? Alberto _____ dos hermanos.	
249. tiene	250. Alberto no tiene tres hermanos; tiene sólo dos h_______.	
250. hermanos	251. Los h______ se llaman José y Federico.	
251. hermanos	252. Hay tres niños y dos niñ___.	

252. niñas	253. No hay tres niños; hay _____ niños.	
253. dos	254. ¿Tiene Alberto dos her____? Sí.	
254. hermanos	255. Hay un niño; hay tres ___s.	
255. niñas	256. ¿Cuántos n_os hay? Tres.	
256. niños	257. ¿Cuántos niños hay? H__ cuatro niños.	
257. Hay	258. ¿No hay una niña? No, hay dos n_os.	
258. niños	259. Esta ca__ tiene cuatro ventanas.	

MODERN LANGUAGE Jr. H.S.-Coll.+

INTRODUCTORY SPANISH

M. W. SULLIVAN, President, Sullivan Associates
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 3,284 frames, paperback, 1,250 pp. (7 units), 8-1/2" x 11-1/2", $18.00 plus Binder.
For use in TEMAC BINDER, $1.75; program reusable, $18.00.
Teacher's Manual included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Hollins College students, Roanoke City Public School students."
Prerequisites: "No special prerequisites."
Additional material required: Tape recorder or language laboratory and accompanying tapes—$64.75.
Average Time: 45 hours (est.).
No Revision.
(1 sample page)

MODERN LANGUAGE

INTRODUCTORY SPANISH
Sullivan; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:

511.

Fill in the missing word:

The table is pretty.

La mesa es __________.

---

bonita

512.

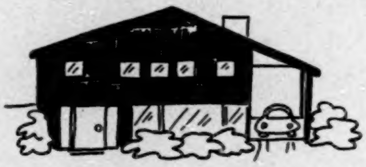
The Spanish adjectives for BLACK, WHITE, PRETTY, etc., end in _____ when they modify masculine nouns, and end in _____ when they modify feminine nouns.

---

o
a

513.

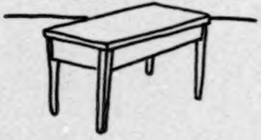
Answer the question.*



Check your answer.*

514.

Ask the question:



Is the table black?

Check.*

Now answer the question. Check.*

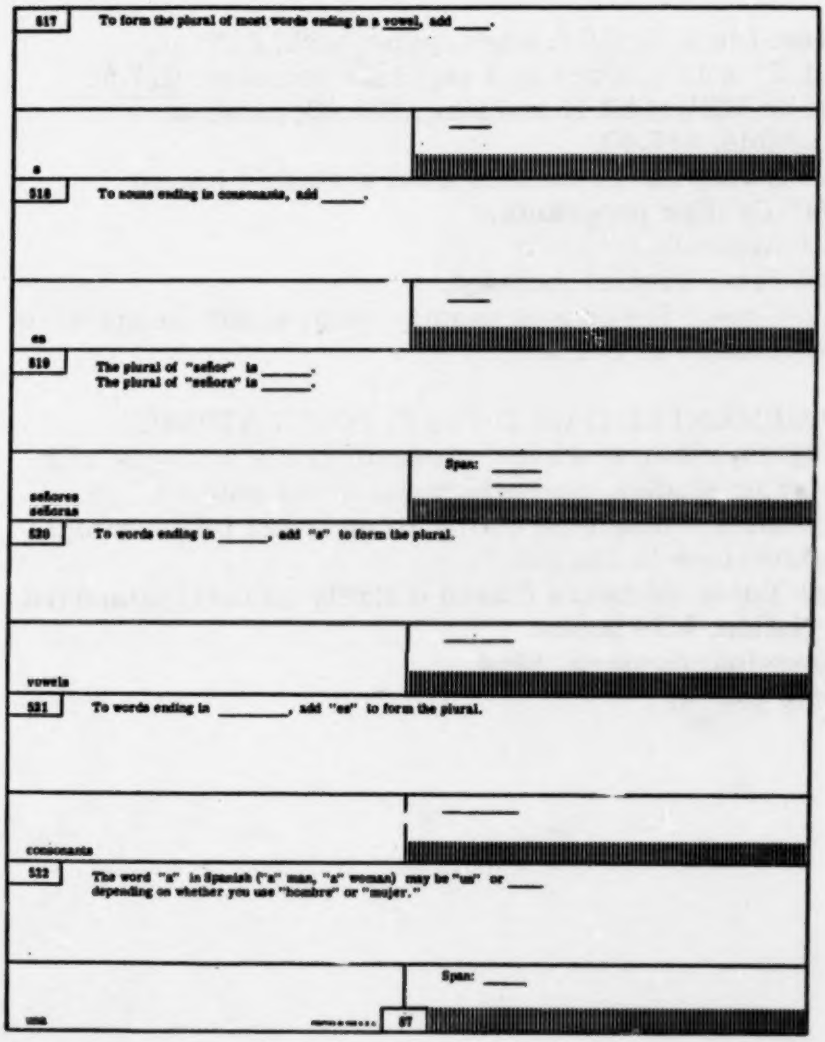
MODERN LANGUAGE SERIES: BASIC SPANISH
JAMES L. EVANS
RAFAEL VALDES, both of Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York.

Programed text, 3,480 frames, paperback, 837 pp., 8 1/2" x 11", bound in 3 separate volumes, $17.50.
For use in MIN/MAX II machine, $25.00; program reusable, $16.50.
Teacher's Manual: General Manual available for all TMI-Grolier programs.
Table of Contents.
Unit and Final Test(s) included.
Multiple Choice Responses usually used; some Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Eighth, ninth, tenth and eleventh grade students with no prior studies or background in the subject."
Prerequisites: "Requires ability to read and follow simple instructions in English."
Average Time: 30 hours (based entirely on data); standard deviation, 5.24 hours.
Next Revision: January, 1964.
(3 sample pages)

MODERN LANGUAGE

MODERN LANGUAGE SERIES: BASIC SPANISH
Evans, Valdes; TEACHING MATERIALS CORPORATION
3 sample pages:



517 To form the plural of most words ending in a vowel, add ____.

____

s

518 To nouns ending in consonants, add ____.

____

es

519 The plural of "señor" is ____.
The plural of "señora" is ____.

Span: ____
____

señores
señoras

520 To words ending in ____, add "s" to form the plural.

____

vowels

521 To words ending in ____, add "es" to form the plural.

____

consonants

522 The word "a" in Spanish ("a" man, "a" woman) may be "un" or ____ depending on whether you use "hombre" or "mujer."

Span: ____

una

87

963 "To be," "to write," and "to have" are all infinitives.

"Hablar" means "to speak." "Hablar" is an ________.

infinitive

964 The "ar" in "estar" (to be) shows that "estar" is an infinitive.

The "ar" in "hablar" (to speak) shows that ________ is also an infinitive.

hablar

965 Many infinitives end in ________, such as "estar" and "hablar."

ar

966 "Hablar" is an infinitive that ends in ________.

ar

967 To form the different persons of "hablar" use the stem "habl."

We take off "ar" from "hablar" to form the s____.

s____

s(tem)

968 "Habl" is the ____ of "hablar."

stem

2217 "Veintidós" and "veintitrés" have accent marks.

22 = ________

23 = ________

22 = veintidós
23 = veintitrés

Span: 22 = ________
23 = ________

2218 "Twenty-two" is "veintidós." (Note accent mark.)

"Twenty-three" is ________

veintitrés (Note accent.)

Span:

2219 Add the Spanish words for "one," "two," "three," "four," and "five" to "veinti" to form "21," "22," "23," "24," and "25."

21 = ________
22 = ________

23 = ________
24 = ________

25 = ________

21 = veintiuno
22 = veintidós
23 = veintitrés
24 = veinticuatro
25 = veinticinco

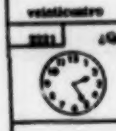
Span: 21 = ________
22 = ________
23 = ________
24 = ________
25 = ________

2220 "Twenty-four" is not "veintecuatro," but ________.

veinticuatro

Span:

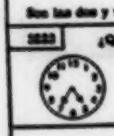
2221 ¿Qué hora es?



Son las dos y veinticinco.

Span:

2222 ¿Qué hora es?



Son las cinco menos veinticinco.

Span:

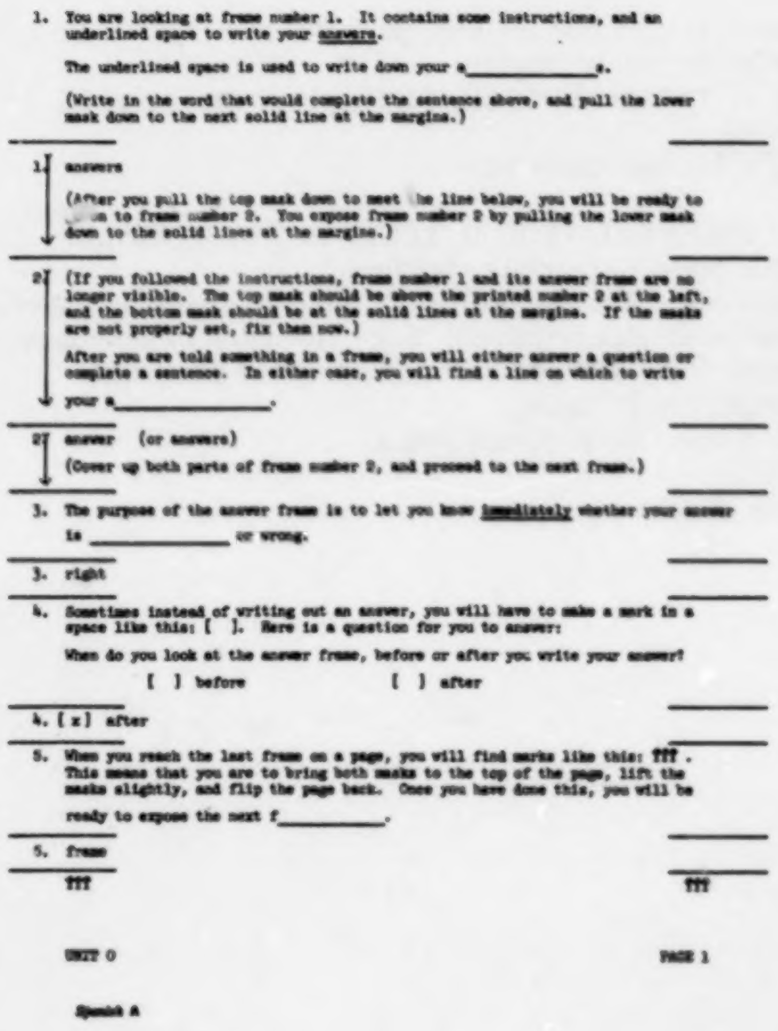
MODERN LANGUAGE Jr. H.S.-Coll.

SPANISH A
First Year Course in Spanish
STANLEY M. SAPON, Professor of Psycholinguistics,
University of Rochester
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 6,602 frames, paperback, 8-1/2" x 11-1/2",
$29.25 including Binder.
For use in TEMAC BINDER, $1.75; program reusable,
$28.50.
Teacher's Manual included.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Ohio State University students."
Prerequisites: "Reading ability of seventh grade or above."
Additional material required: Tape recorder or language laboratory and tapes accompanying the program—$200.00 for 21 tapes.
Average Time: 50-85 hours (est.).
No Revision.
(1 sample page)

MODERN LANGUAGE
SPANISH A
Sapon; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



1. You are looking at frame number 1. It contains some instructions, and an underlined space to write your answers.

The underlined space is used to write down your a______________s.

(Write in the word that would complete the sentence above, and pull the lower mask down to the next solid line at the margins.)

1. answers

(After you pull the top mask down to meet the line below, you will be ready to [illegible]n to frame number 2. You expose frame number 2 by pulling the lower mask down to the solid lines at the margins.)

2. (If you followed the instructions, frame number 1 and its answer frame are no longer visible. The top mask should be above the printed number 2 at the left, and the bottom mask should be at the solid lines at the margins. If the masks are not properly set, fix them now.)

After you are told something in a frame, you will either answer a question or complete a sentence. In either case, you will find a line on which to write your a________________.

2. answer (or answers)

(Cover up both parts of frame number 2, and proceed to the next frame.)

3. The purpose of the answer frame is to let you know immediately whether your answer is ______________ or wrong.

3. right

4. Sometimes instead of writing out an answer, you will have to make a mark in a space like this: [ ]. Here is a question for you to answer:

When do you look at the answer frame, before or after you write your answer?

[ ] before [ ] after

4. [x] after

5. When you reach the last frame on a page, you will find marks like this: ††† . This means that you are to bring both masks to the top of the page, lift the masks slightly, and flip the page back. Once you have done this, you will be ready to expose the next f__________.

5. frame

††† †††

UNIT 0 PAGE 1

Spanish A

SPANISH (ELEMENTARY)
CLT Spanish, Series I (No. 16-12-04)
CHARLES I. FOLTZ, author
Published by ELECTRONIC TEACHING LABORATORIES,
5034 Wisconsin Avenue, N.W., Washington 16, D.C.

For use in LANGUAGE LABORATORY, program reusable, 2400 frames, $89.95.
Teacher's Manual available, $1.25.
Table of Contents, Index.
Unit test(s), integral part of program.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: Minimum requirement: tape recorder.
Average Time: 12 hours (est.).
Next Revision:
(1 sample page)

MODERN LANGUAGE

SPANISH (ELEMENTARY)
Foltz; ELECTRONIC TEACHING LABORATORIES
one sample page:

SAMPLE FRAMES (from tapescript) CLT Spanish (Series I)

1.	STIMULUS	Yo sigo el taxi. Y ellos ?
	RESPONSE	(timed pause for student response)
	MASTER	Ellos siguen el taxi.
	REINFORCEMENT	(timed pause for repetition)
2.	STIMULUS	Come Ud. carne ?
	RESPONSE	(timed pause for student response)
	MASTER	Si, yo como carne.
	REINFORCEMENT	(timed pause for student response)

MODERN LANGUAGE **H.S.**

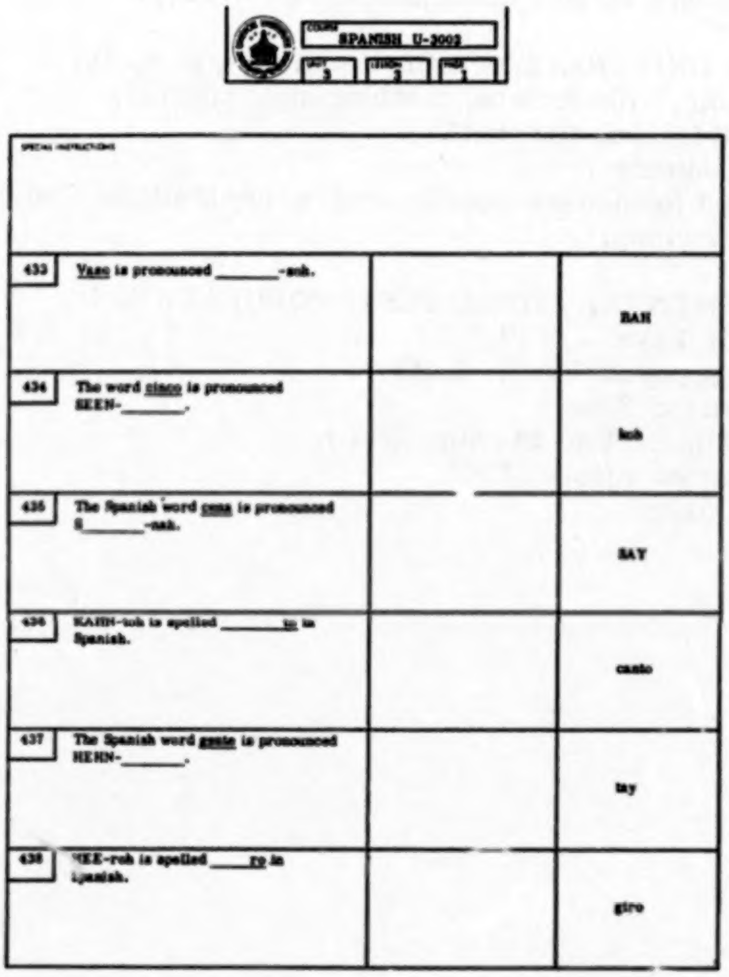
SPANISH U-3002
UNIVERSAL ELECTRONICS LABORATORIES CORPORATION
Published by UNIVERSAL TEACHING MACHINE INSTITUTE,
510 Hudson Street, Hackensack, New Jersey.

For use in UNIVERSAL MODEL U machine, program reusable, 2160 frames, machine and program, $25.00 (school discount).
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Grade Level - 8-12."
Other using population(s): Adult.
Prerequisites: None
Average Time: 30 to 36 hours (est.).
Next Revision: August, 1963.
(2 sample pages)

MODERN LANGUAGE

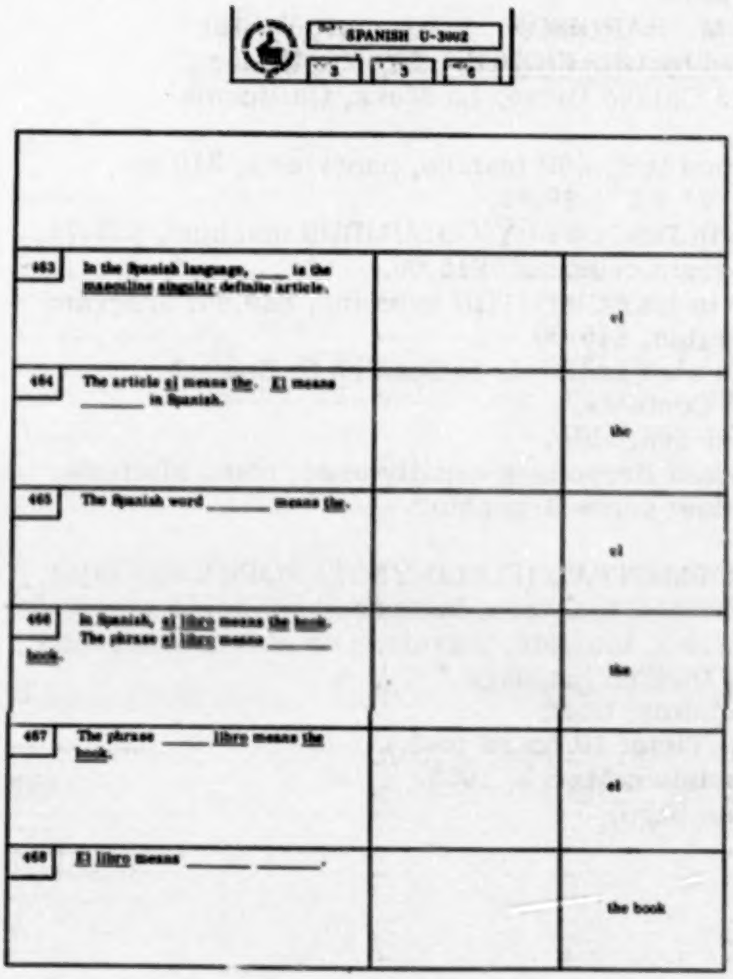
SPANISH U-3002
Universal Electronics Laboratories Corporation;
UNIVERSAL TEACHING MACHINE INSTITUTE
2 sample pages:



SPANISH U-3002

3 2 1

SPECIAL INSTRUCTIONS		
433 Vaso is pronounced _______-soh.		BAH
434 The word cinco is pronounced SEEN-_______.		koh
435 The Spanish word cena is pronounced S_______-nah.		SAY
436 KAHN-toh is spelled _______to in Spanish.		canto
437 The Spanish word gente is pronounced HEHN-_______.		tay
438 HEE-roh is spelled _____ro in Spanish.		giro



SPANISH U-3002

3 3 6

463 In the Spanish language, ____ is the masculine singular definite article.		el
464 The article el means the. El means _______ in Spanish.		the
465 The Spanish word _______ means the.		el
466 In Spanish, el libro means the book. The phrase el libro means _______ book.		the
467 The phrase _____ libro means the book.		el
468 El libro means _______ _______.		the book

MODERN LANGUAGE Open

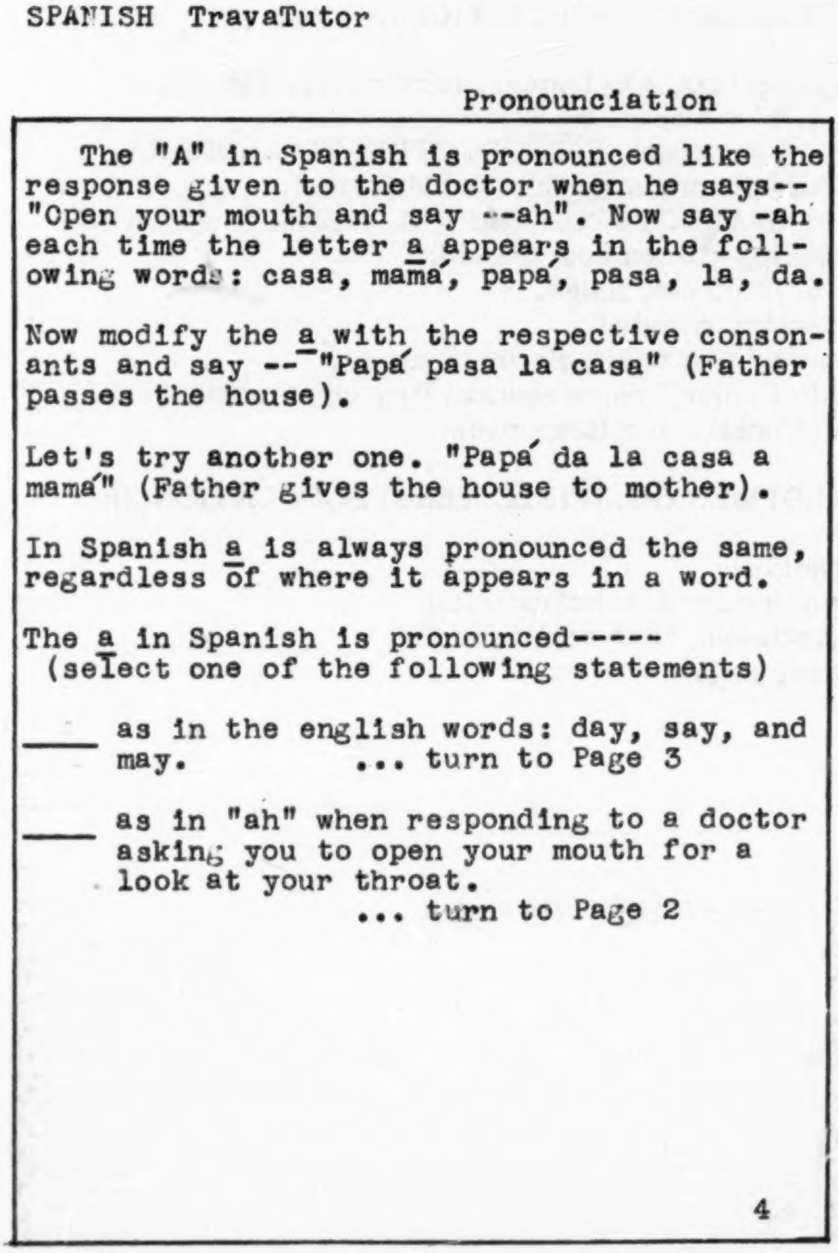
SPANISH TRAVATUTOR
JAC D. MEACHAM, Director, Universal Learning Division
JAMES M. HARDISON, Instructor, Writer
Published by GRAFICROLL SYSTEMS, Inc.,
4215 Calavo Drive, La Mesa, California

Programed text, 850 frames, paperback, 210 pp., 5 1/2" x 8", $9.95.
For use in DISCOVERY COLUMBUS machine, $38.75; program reusable, $15.00.
For use in EXECUTUTOR machine, $29.95; program reusable, $15.00.
Program also available in Spanish to English.
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Students, teachers, businessmen, servicemen, families, tourists, travelers or anyone interested in a foreign language."
Prerequisites: None
Average Time: 10 hours (est.).
Next Revision: March, 1963.
(1 sample page)

MODERN LANGUAGES

SPANISH TRAVATUTOR
Meacham, Hardison; GRAFICROLL SYSTEMS
one sample page:



SPANISH TravaTutor

Pronounciation

The "A" in Spanish is pronounced like the response given to the doctor when he says--"Open your mouth and say --ah". Now say -ah each time the letter a appears in the following words: casa, mamá, papá, pasa, la, da.

Now modify the a with the respective consonants and say -- "Papá pasa la casa" (Father passes the house).

Let's try another one. "Papá da la casa a mamá" (Father gives the house to mother).

In Spanish a is always pronounced the same, regardless of where it appears in a word.

The a in Spanish is pronounced-----
(select one of the following statements)

____ as in the english words: day, say, and may. ... turn to Page 3

____ as in "ah" when responding to a doctor asking you to open your mouth for a look at your throat. ... turn to Page 2

4

ADVENTURES IN ALGEBRA (TutorText)
NORMAN A. CROWDER,
GRACE C. MARTIN, both of U.S.I., Educational Science Division
Published by DOUBLEDAY & CO., Inc.,
575 Madison Avenue, N.Y.C.

Programed text, 336 frames, hard cover, 348 pp., 8 1/4" x 5 3/8", $4.95.
A similar program, INTRODUCTION TO ALGEBRA (TutorFilm), available in TM format.
For use in AUTOTUTOR MARK II, $1,250; program reusable, 410 frames, $40.00.
Table of Contents, Index.
Unit Test(s) included.
Programed text available in Japanese.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

Prerequisite:
Average Time: 6-8 hours (est.).
Next Revision: "Not scheduled."
(1 sample page)

MATHEMATICS-ALGEBRA

ADVENTURES IN ALGEBRA
Crowder, Martin; DOUBLEDAY & CO.
one sample page

Sample from Introduction to Algebra

YOUR ANSWER: If $x + a = 0$, $x = -a$.

You are correct. If we wish to solve any equation of the form $x + a = 0$, where a is a known number and x is the unknown, we can proceed as follows:

$$x + a = 0$$

Subtract a from both sides:

$$x + a - a = 0 - a$$

$a - a = 0$, so

$$x + 0 = -a$$

$$x = -a$$

If we had begun with the equation $x - a = 0$, we would have

$$x - a = 0$$

Add a to both sides:

$$x - a + a = 0 + a$$

$$x = a$$

Now, as we said at the beginning of this lesson, in solving an equation such as $x - a = 0$ or $x + a = 0$, we want to deduce from our original equation one in the form "$x =$ some number." When we have a term such as a either added or subtracted from our unknown, x, what rule will summarize the calculations above and enable us to get rid of the troublesome a on the left-hand side of the equation?

Move the a to the other side of the equation and change its sign.	C
Move the a to the other side and put a minus sign in front of it.	B
Move the a to the other side.	A

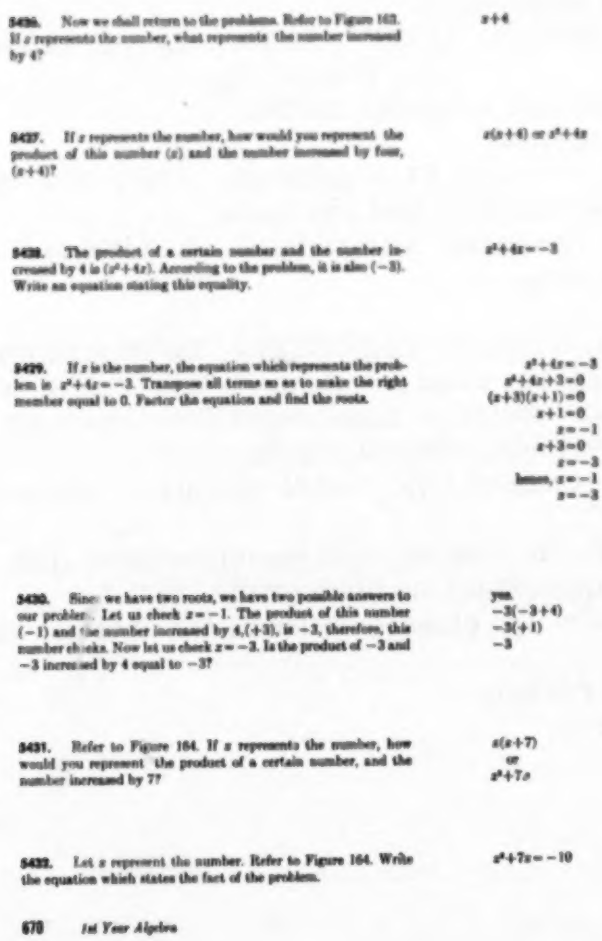
ALGEBRA I
DANIEL P. MURPHY, Teaching Fellow State University of Iowa.
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 8,200 frames, paperback, 1,290 pp., 8-1/2" x 11-1/2", $13.25. Available in 5 separate units @ $3.25 each.
For use in TEMAC BINDER, $1.25; program reusable, $12.00.
Teacher's Manual available, $.50.
Table of Contents.
Unit Test(s) available. More than one equivalent form of test available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Selected groups, Roanoke City Public Schools."
Other using population(s): "Adult education groups; review."
Prerequisites: "No special student prerequisites other than those required for normal ninth grade algebra."
Average Time: 135 classroom hours for average students (est.).
No revision of this particular program. New programs in ninth grade algebra will be developed.
(1 sample page)

MATHEMATICS – ALGEBRA

ALGEBRA I
Murphy; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page



5426. Now we shall return to the problems. Refer to Figure 163. If x represents the number, what represents the number increased by 4?	$x+4$
5427. If x represents the number, how would you represent the product of this number (x) and the number increased by four, $(x+4)$?	$x(x+4)$ or x^2+4x
5428. The product of a certain number and the number increased by 4 is (x^2+4x). According to the problem, it is also (-3). Write an equation stating this equality.	$x^2+4x=-3$
5429. If x is the number, the equation which represents the problem is $x^2+4x=-3$. Transpose all terms so as to make the right member equal to 0. Factor the equation and find the roots.	$x^2+4x=-3$ $x^2+4x+3=0$ $(x+3)(x+1)=0$ $x+1=0$ $x=-1$ $x+3=0$ $x=-3$ hence, $x=-1$ $x=-3$
5430. Since we have two roots, we have two possible answers to our problem. Let us check $x=-1$. The product of this number (-1) and the number increased by 4, $(+3)$, is -3, therefore, this number checks. Now let us check $x=-3$. Is the product of -3 and -3 increased by 4 equal to -3?	yes. $-3(-3+4)$ $-3(+1)$ -3
5431. Refer to Figure 164. If x represents the number, how would you represent the product of a certain number, and the number increased by 7?	$x(x+7)$ or x^2+7x
5432. Let x represent the number. Refer to Figure 164. Write the equation which states the fact of the problem.	$x^2+7x=-10$

670 *1st Year Algebra*

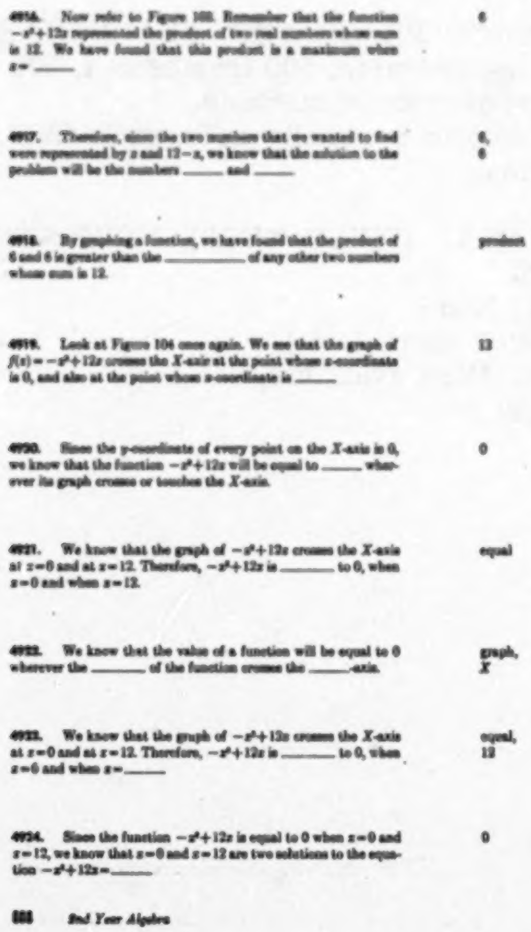
ALGEBRA II
ROBERT J. TITIEV, Britannica Center for Studies in Learning
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 6,750 frames, paperback, 1,036 pp., 8-1/2" x 11-1/2", $13.25. Available in 5 separate units @ $3.25 each.
For use in TEMAC BINDER, $1.25; program reusable, $12.00.
Teacher's Manual available, $2.50.
Table of Contents.
Unit Test(s) available $1.60 per copy. More than one equivalent form of test available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Naive groups from the Roanoke City Public Schools; field test population classrooms from Roanoke City Public Schools. Roanoke, Virginia."
Other using population(s): "Adult education, professional review."
Prerequisites: "No special prerequisites other than reading ability approximating ninth grade level."
Average Time: 120 classroom hours for average students (est.).
No expected revision.
(1 sample page)

MATHEMATICS – ALGEBRA

ALGEBRA II
Titiev; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page



4916. Now refer to Figure 103. Remember that the function $-x^2+12x$ represented the product of two real numbers whose sum is 12. We have found that this product is a maximum when $x=$ _____	6
4917. Therefore, since the two numbers that we wanted to find were represented by x and $12-x$, we know that the solution to the problem will be the numbers _____ and _____	6, 6
4918. By graphing a function, we have found that the product of 6 and 6 is greater than the _________ of any other two numbers whose sum is 12.	product
4919. Look at Figure 104 once again. We see that the graph of $f(x)=-x^2+12x$ crosses the X-axis at the point whose x-coordinate is 0, and also at the point whose x-coordinate is _____	12
4920. Since the y-coordinate of every point on the X-axis is 0, we know that the function $-x^2+12x$ will be equal to _____ wherever its graph crosses or touches the X-axis.	0
4921. We know that the graph of $-x^2+12x$ crosses the X-axis at $x=0$ and at $x=12$. Therefore, $-x^2+12x$ is _______ to 0, when $x=0$ and when $x=12$.	equal
4922. We know that the value of a function will be equal to 0 wherever the _______ of the function crosses the _____-axis.	graph, X
4923. We know that the graph of $-x^2+12x$ crosses the X-axis at $x=0$ and at $x=12$. Therefore, $-x^2+12x$ is _______ to 0, when $x=6$ and when $x=$_____	equal, 12
4924. Since the function $-x^2+12x$ is equal to 0 when $x=0$ and $x=12$, we know that $x=0$ and $x=12$ are two solutions to the equation $-x^2+12x=$_____	0

MATHEMATICS – ALGEBRA Jr. H.S.

ALGEBRA I and II
PROFESSOR KRAKOW, programer
MARTIN MEO, New York University
ALEXANDER SCHURE, President, N. Y. Institute of Technology
Published by CENTRAL SCIENTIFIC Company, 1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95; program not reusable, 500 frames in I, 500 in II, I or II included in price of machine.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Over 200."
Prerequisites: None.
Average Time: 3 hours (est.).
Next Revision: "Now available."
(1 sample page)

MATHEMATICS - ALGEBRA

ALGEBRA I and II
Krakow, Meo, Schure; CENTRAL SCIENTIFIC CO.
one sample page

ALGEBRA II

3. $16a^3b^3$ is called a ________________.

. . . .

monomial

4. $15a^2 + 9b^2 + 8c + d^3$ is called a ________________.

. . . .

polynomial

5. When we multiply a polynomial by a monomial we first multiply all the terms of the polynomial separately by the monomial and then combine the resulting products using the co --- ct sign.

. . . .

coRREct

6. Let's work a sample problem. To multiply 16r + t by 2r we begin by rewriting the expression as we would an arithmetical multiplication. 16r + t
2r

Our first step is multiplying 16r . 2r giving ________.
$32r^2$

. . . .

MATHEMATICS-ALGEBRA H.S.+

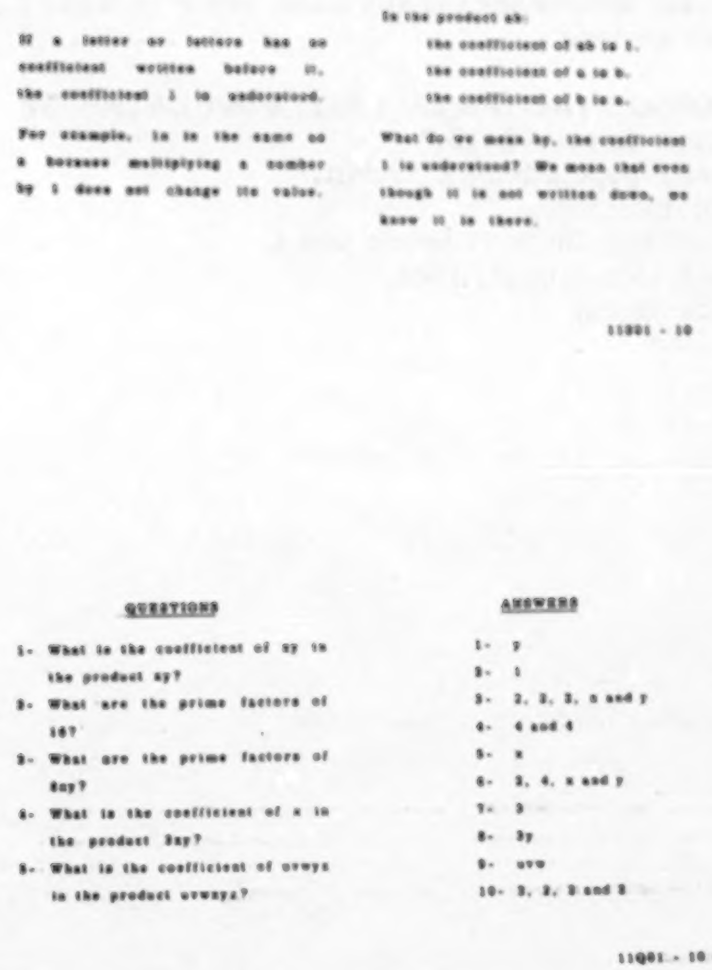
ALGEBRA 11
R. CLAYTON COURSEY, Education Engineering, Inc.
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 15,200 frames, paperback, 540 pp.,
5" x 7", available in 15 separate units at $3.75 each.
For use in SPEED machine, program reusable, $152.00
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $10.00 per unit.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: Arithmetic
Additional material required: SPEED teaching machine
$700 & $850.
Average Time: 30 hours (est.).
Next Revision:
(1 sample page)

MATHEMATICS-ALGEBRA

ALGEBRA 11
Coursey; EDUCATION ENGINEERING, Inc.
one sample page



In the product ab:

the coefficient of ab is 1.
the coefficient of a is b.
the coefficient of b is a.

If a letter or letters has no coefficient written before it, the coefficient 1 is understood.

For example, 1a is the same as a because multiplying a number by 1 does not change its value.

What do we mean by, the coefficient 1 is understood? We mean that even though it is not written down, we know it is there.

11S01 - 10

QUESTIONS

1- What is the coefficient of xy in the product xy?
2- What are the prime factors of 16?
3- What are the prime factors of 8xy?
4- What is the coefficient of x in the product 3xy?
5- What is the coefficient of uvwyz in the product uvwxyz?

ANSWERS

1- y
2- 1
3- 2, 2, 2, x and y
4- 4 and 4
5- x
6- 2, 4, x and y
7- 3
8- 3y
9- uvw
10- 2, 2, 2 and 2

11Q01 - 10

MATHEMATICS – ALGEBRA **H.S.**

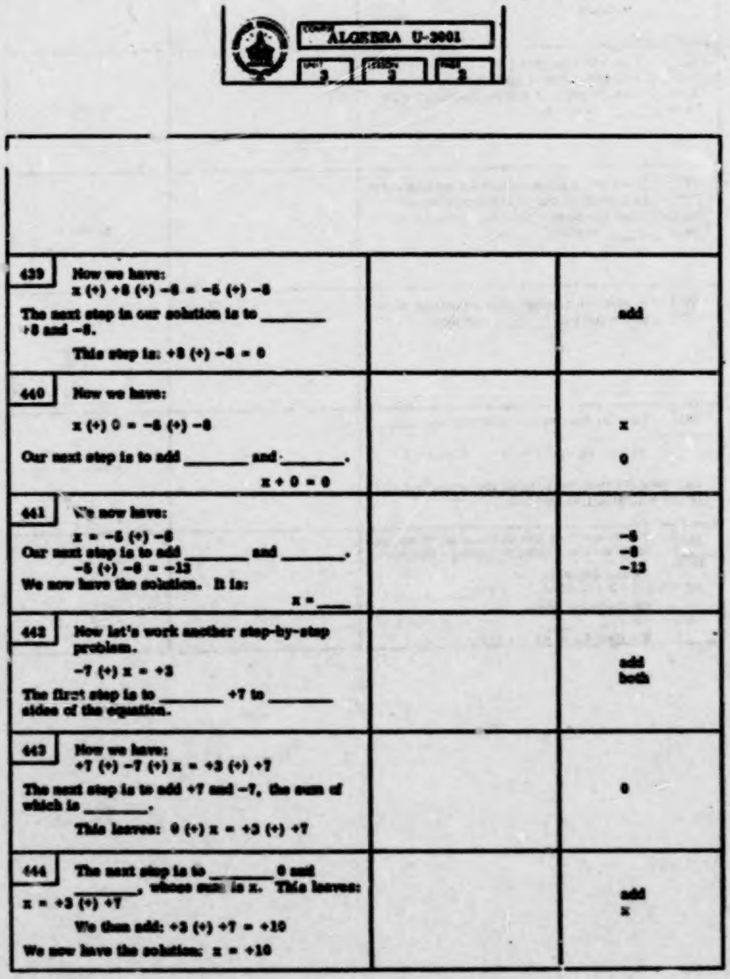
ALGEBRA U-3001
UNIVERSAL ELECTRONICS LABORATORIES
CORPORATION
Published by UNIVERSAL TEACHING MACHINE
INSTITUTE,
510 Hudson Street, Hackensack, New Jersey.

For use in UNIVERSAL MODEL U machine, program reusable, 2160 frames, machine and program, $25.00 (school discount).
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Grade Level - 8-12."
Other using population(s): "Adult."
Prerequisites: None
Average Time: 36 to 45 hours (est.).
Next Revision: August, 1963.
(2 sample pages)

MATHEMATICS – ALGEBRA

ALGEBRA U-3001
Universal Electronics Laboratories Corporation; UNIVERSAL TEACHING MACHINCE INSTITUTE
2 sample pages



COURSE ALGEBRA U-3001
UNIT 3 LESSON 3 PAGE 3

439 Now we have: x (+) +8 (+) −8 = −5 (+) −8 The next step in our solution is to ________ +8 and −8. This step is: +8 (+) −8 = 0		add
440 Now we have: x (+) 0 = −5 (+) −8 Our next step is to add ________ and ________. x + 0 = x		x 0
441 We now have: x = −5 (+) −8 Our next step is to add ________ and ________. −5 (+) −8 = −13 We now have the solution. It is: x = ____		−5 −8 −13
442 Now let's work another step-by-step problem. −7 (+) x = +3 The first step is to ________ +7 to ________ sides of the equation.		add both
443 Now we have: +7 (+) −7 (+) x = +3 (+) +7 The next step is to add +7 and −7, the sum of which is ________. This leaves: 0 (+) x = +3 (+) +7		0
444 The next step is to ________ 0 and ________, whose sum is x. This leaves: x = +3 (+) +7 We then add: +3 (+) +7 = +10 We now have the solution: x = +10		add x

ALGEBRA U-3001

3	3	5

457 Addition in algebra is roughly similar to addition in arithmetic. A negative number plus a negative equals a _______ number.		negative
458 If we add a negative and a positive number, and, if the negative number is larger, then the sum of the two numbers will be a _______ number.		negative
459 If we add a positive and a negative number, and, if the positive number is larger, then the sum of the two numbers will be a _______ number.		positive
460 A positive number plus a positive number equals a _______ number.		positive
461 Now let's solve for x in this equation. +3 · x (+) −2 (−) −3 = +5 (−) −2 Our general rule for solving for x (is / is not) to get x by itself on one side.		is
462 First, we'll do the obvious addition problems on each side, to shorten the equation. On the left side: +3 · x (+) −2 (−) −3 = 3 · x (+) _______ On the right side: +5 (−) −2 = _______ We then have +3 · x (+0 +1 = +7)		+1 +7

ALGEBRAIC EQUATIONS

LAURENCE WHISLER, Consultant in Programed Education, Central Scientific Co.

Published by CENTRAL SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

Planned for use in CENCO PROGRAMED LEARNER, $2.95; 100 frames.

Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Planned population of 100."

Prerequisites:

Average Time: 3 hours (est.).

Next Revision: September, 1963.

(1 sample page)

MATHEMATICS - ALGEBRA

ALGEBRAIC EQUATIONS
Whisler; CENTRAL SCIENTIFIC Company
one sample page

ALGEBRAIC EQUATIONS

28. Use division to change an equation so that it can be used simultaneously with another equation.
First set of equations
9A - B 31 leave unchanged 9A - B 31
92A - 23B 253 divide by 23 ?

. . . .

Complete equation
4A - B 11

29. Solve for A by subtraction
9A - B 31
4A - B 11

. . . .

Complete equations
5A 20
A 4

30. Another problem: Machines J and K make the same product, but the machine K is older and slower. With 3J and 2K machines, 7 finished products can be made per hour. Write the equation.

. . . .

Complete equation
3J 2K 7

EQUATIONS AND INEQUALITIES
EUGENE D. NICHOLS
ROBERT KALIN
HENRY GARLAND, all of Florida State University.
Published by: HOLT, RINEHART & WINSTON,
383 Madison Ave., N. Y. 17, N.Y.

Programed text, 284 frames, paperback, 80 pp., 7" x 10", $.96.
Teacher's Manual available, $.16.
Table of Contents.
Final Test included.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Grades 7 thru 12."
Prerequisites: "Four fundamental operations with directed numbers."
Average Time: 3-9 hours (est.).
Next Revision: Unknown.
(1 sample page)

MATHEMATICS – ALGEBRA

EQUATIONS AND INEQUALITIES
Nichols, Kalin, Garland; RINEHART & WINSTON
one sample page

77 If Writeall writes 5 in place of □ in

$$\frac{10}{\square} + 4 = 9,$$

does he obtain a true or a false statement?

STOP STOP

77 false

78 If Writeall writes 4 in place of □ in

$$\frac{10}{\square} + 4 = 9,$$

does he obtain a true or a false statement?

STOP STOP

78 false

79 What should Writeall write in place of □ in

$$\frac{10}{\square} + 4 = 9$$

to get a true statement?

STOP STOP

79 2

80 Does 0 in place of □ in

$$\square \times 9 + 3 = 3$$

give a true statement?

STOP STOP

80 Yes

81 What should Writeall write in place of □ in

$$\square \times 25 + 9 = 9,$$

to get a true statement?

STOP STOP

81 0

INTENSIFIED ALGEBRA R-1
A Review or Remedial Program
NANCY ANDERSON, University of Maryland
THOMAS GILBERT
Published by PROGRAMMED TEACHING AIDS, Inc.
3810 S. Four Mile Run Drive, Arlington, Virginia.

For use in FERSTER TUTOR, Program reusable, $10.00, machine and program, separate answer tapes replaceable. 1,300 frames (approx.)
Teacher's Manual included.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Both High School and College freshman."
Prerequisites:
Average Time: 20 hours (est.).
Next Revision: January, 1964.
(1 sample page)

MATHEMATICS-ALGEBRA

INTENSIFIED ALGEBRA R-1
Anderson, Gilbert; PROGRAMMED TEACHING AIDS, Inc.
one sample page

52. But the fact that $3 \cdot 7 = 7 \cdot 3$ follows from the _____ _____ law for multiplication — commutative

……

TOPIC IV - Multiplication and Division of Signed Numbers

41. Since $-x$ is defined equal to $(-1)\,x$ then $-(-x) = (-1)\,(-x) =$ _____. — x

……

TOPIC VI - Operations on Algebraic Expressions

2. So $3x+4x = (3+4)x = \underset{\text{(total)}}{\underline{\qquad}}$. — 7x

……

TOPIC VII - Division

14. $\frac{8x^2}{2x} =$ _____. — 4x

……

TOPIC X - Linear Equations 1.

75. Solve $\frac{w}{30} = \frac{-1}{5}$ — -10

……

TOPIC XII - Fractions 1.

24. **Thus a fraction can sometimes be simplified by removing factors common to the numerator and the denominator. In this way** — $\frac{x+a}{3}$

$$\frac{x^2-a^2}{3x-3a} = \frac{(x+a)\,(x-a)}{3\quad(x-a)} = \_\_\_\_.$$

……

MATHEMATICS – ALGEBRA Jr. H.S.

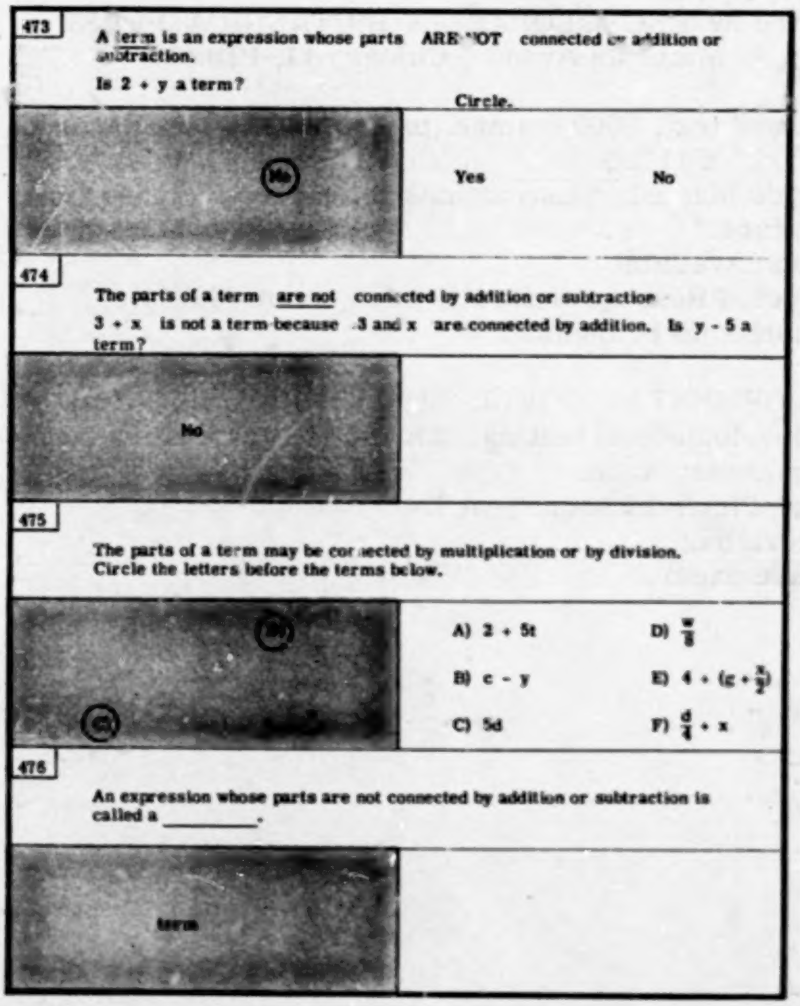
INTRODUCTION TO ALGEBRA
JACOB REGER, Programer, General Programmed Teaching Corporation
JOHN MORRIS, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1000 frames, paperback, 200 pp., 8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in preface."
Final test available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: 8th and 9th grade students."
Prerequisites: None.
Average Time: 10 hours (est.).
Next Revision:
(1 sample page)

MATHEMATICS – ALGEBRA

INTRODUCTION TO ALGEBRA
Reger, Morris; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page



473

A term is an expression whose parts ARE NOT connected by addition or subtraction.

Is 2 + y a term?

Circle.

(No)

Yes No

474

The parts of a term are not connected by addition or subtraction

3 + x is not a term because 3 and x are connected by addition. Is y - 5 a term?

No

475

The parts of a term may be connected by multiplication or by division. Circle the letters before the terms below.

(D)) (C))

A) 2 + 5t
B) c - y
C) 5d
D) $\frac{w}{8}$
E) $4 + (g + \frac{x}{2})$
F) $\frac{d}{4} + x$

476

An expression whose parts are not connected by addition or subtraction is called a __________.

term

MATHEMATICS - ALGEBRA Jr. H.S.

AN INTRODUCTION TO VERBAL PROBLEMS IN ALGEBRA
DR. NATHAN LAZAR, Mathematics Education, Ohio State University
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1,024 frames, paperback, 147 pp., 8-1/2" x 11-1/2", $4.75.
For use in TEMAC BINDER, $1.25; program reusable, $3.50.
Teacher's Manual available, $1.00.
Table of Contents.
Unit Test(s) available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Berkeley, California public schools on development testing. Roanoke City Schools on evaluation testing."
Other using population(s): "Any remedial students, pre-algebra."
Prerequisites: "Ability to solve equation 3W is equal to 15."
Average Time: 10-20 hours (est.).
No Revision.
(1 sample page)

MATHEMATICS – ALGEBRA

AN INTRODUCTION TO VERBAL PROBLEMS IN ALGEBRA

Lazar; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page

9. The value of y which makes $6y = 12$ a true statement is the number ______. Therefore, we say that this number is a *solution* of the equation, $6y =$ ______.	2 12
10. The solution of the equation, $5m = 15$, is the number ______.	3
11. The equation, $2m = 12$, means that "twice a certain unknown number, represented by the letter m, is equal to twelve." This statement in *words* is called a *translation* of the equation *into words*.	
12. When we express the meaning of the equation, $4w = 16$, as "four times a certain number, represented by w, is equal to sixteen," we say that we have *translated* the equation, $4w = 16$, into ______.	words
13. Another way of saying this is that the statement "four times a certain number, represented by w, is equal to sixteen," is a *translation* of the equation, ______.	$4w = 16$
14. The sentence which expresses, in words, the meaning of an equation is called a ______ of the equation into words.	translation
15. We have seen that a *solution* of the equation, $4n = 24$, is the number ______.	6
16. Furthermore, 6 is the *only* solution of $4n = 24$ since, when any number other than 6 is multiplied by 4 we (do/do not) ______ get 24 as the product.	do not

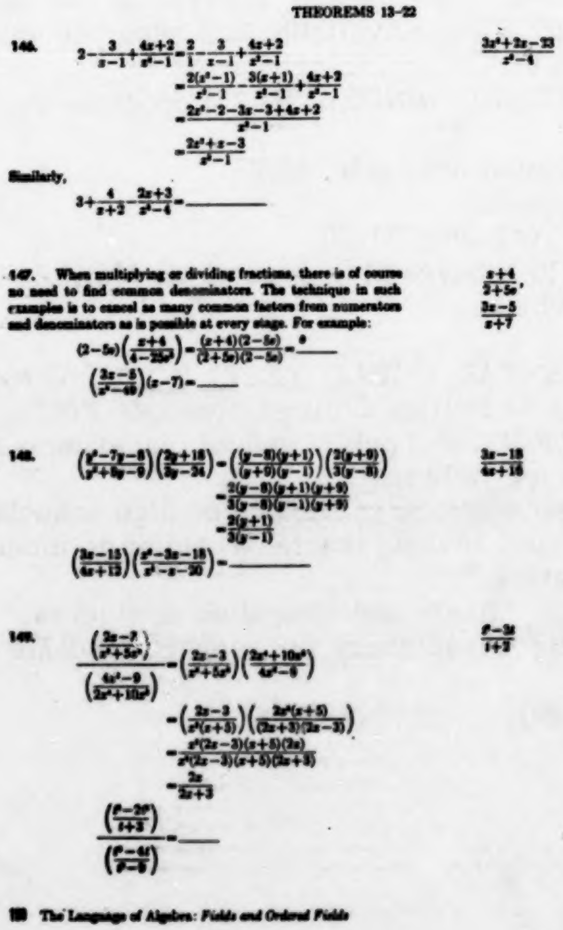
THE LANGUAGE OF ALGEBRA
Fields and Ordered Fields
F. WILLIAM LAWVERE, Britannica Center for Studies in Learning and Motivation
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1,947 frames, paperback, 342 pp., 8-1/2" x 11-1/2", $7.30. Available in 2 separate units @ $4.50 each.
For use in TEMAC BINDER, $1.25; program reusable, $6.05.
Teacher's Manual available, $1.25.
Table of Contents.
Unit Test(s) available, $1.60.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Students at Hollins College, Roanoke Public Schools developmental and public school classrooms at Roanoke, Virginia for field test."
Other using population(s): "Advanced high school students, professional review, teacher training in modern mathematics."
Prerequisites: "Basic understanding of algebra."
Average Time: 35-40 hours for average students (est.).
No Revision.
(1 sample page)

MATHEMATICS – ALGEBRA

THE LANGUAGE OF ALGEBRA
Lawvere; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page



THEOREMS 13–22

146. $$2-\frac{3}{x-1}+\frac{4x+2}{x^2-1}=\frac{2}{1}-\frac{3}{x-1}+\frac{4x+2}{x^2-1}$$
$$=\frac{2(x^2-1)}{x^2-1}-\frac{3(x+1)}{x^2-1}+\frac{4x+2}{x^2-1}$$
$$=\frac{2x^2-2-3x-3+4x+2}{x^2-1}$$
$$=\frac{2x^2+x-3}{x^2-1}$$

Similarly,

$$3+\frac{4}{x+2}-\frac{2x+3}{x^2-4}=\underline{\qquad\qquad}$$

$\frac{3x^2+2x-23}{x^2-4}$

147. When multiplying or dividing fractions, there is of course no need to find common denominators. The technique in such examples is to cancel as many common factors from numerators and denominators as is possible at every stage. For example:

$$(2-5x)\left(\frac{x+4}{4-25x^2}\right)=\frac{(x+4)(2-5x)}{(2+5x)(2-5x)}=\overset{*}{\underline{\qquad\quad}}$$
$$\left(\frac{3x-5}{x^2-49}\right)(x-7)=\underline{\qquad\quad}$$

$\frac{x+4}{2+5x}$, $\frac{3x-5}{x+7}$

148. $$\left(\frac{y^2-7y-8}{y^2+8y-9}\right)\left(\frac{2y+18}{3y-24}\right)=\left(\frac{(y-8)(y+1)}{(y+9)(y-1)}\right)\left(\frac{2(y+9)}{3(y-8)}\right)$$
$$=\frac{2(y-8)(y+1)(y+9)}{3(y-8)(y-1)(y+9)}$$
$$=\frac{2(y+1)}{3(y-1)}$$
$$\left(\frac{3x-15}{4x+12}\right)\left(\frac{x^2-3x-18}{x^2-x-20}\right)=\underline{\qquad\qquad}$$

$\frac{3x-18}{4x+16}$

149. $$\frac{\left(\frac{2x-3}{x^3+5x^2}\right)}{\left(\frac{4x^2-9}{2x^4+10x^3}\right)}=\left(\frac{2x-3}{x^3+5x^2}\right)\left(\frac{2x^4+10x^3}{4x^2-9}\right)$$
$$=\left(\frac{2x-3}{x^2(x+5)}\right)\left(\frac{2x^3(x+5)}{(2x+3)(2x-3)}\right)$$
$$=\frac{x^2(2x-3)(x+5)(2x)}{x^2(2x-3)(x+5)(2x+3)}$$
$$=\frac{2x}{2x+3}$$
$$\frac{\left(\frac{t^2-2t^3}{t+3}\right)}{\left(\frac{t^2-4t^4}{t^2-9}\right)}=\underline{\qquad}$$

$\frac{t-3}{1+2t}$

150 The Language of Algebra: *Fields and Ordered Fields*

NUMBER SENTENCES
An Introduction to Equation Solving
VERNON L. DAUSCH, Millburn Jr. H. S.
MARTIN M. MOSKOWITZ, Mathematics Department, Vailsburg H. S.
ERNEST R. RANUCCI, Newark State College
MORTON SELTZER, Mathematics Department, Weequahic H. S.
EDWARD J. ZOLL, Newark State College
Published by THE MACMILLAN COMPANY,
60 Fifth Avenue, New York 11, New York

Programed text, 600 frames, 144 pp., paperback, 8-1/4" x 11", $1.50.
For optional use in FLEXITAB BINDER, $1.67 per copy, program can be reusable.
Teacher's Manual in preparation.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Average 7th and 8th grade students. Some testing of students in Grades 5 and 6."
Prerequisites: "Programs will fit in with both "modern" and traditional backgrounds."
Average Time: 12-15 hours (est.).
Next Revision:
(1 sample page)

MATHEMATICS-ALGEBRA

NUMBER SENTENCES
Dausch, Moskowitz, Ranucci, Seltzer, Zoll; THE MACMILLAN COMPANY
one sample page

SPECIAL PROPERTIES OF THE NUMBER 0

110. In the last few sections you have been dealing with properties of operations. Now you are going to take a look at special properties of certain *numbers*. First we will talk about the number 0. When 0 is added to 7, the sum is —?—. a. 0 b. 7	b. 7
111. Look at the list below and fill in the blanks to make each of the number sentences true.	
a. $6 + 0 =$ ___	a. 6
b. $17 + 0 =$ ____	b. 17
c. $0 + 0 =$ ___	c. 0
d. $1 + 0 =$ ___	d. 1
e. $a + 0 =$ ___	e. *a*
112. When 0 is added to any number, it —?— change that number. a. does b. does not	b. does not
113. No matter what number *a* stands for, $a + 0 =$ —?—. a. 0 b. 1 c. *a*	c. *a*
114. You know that $a + 0 = a$. And you know that addition is commutative. Then you can say that $0 + a =$ —?—. a. 0 b. 1 c. *a*	c. *a*

MATHEMATICS - ALGEBRA Jr. H.S.-Coll.

PROGRAMMED BEGINNING ALGEBRA
IRVING DROOYAN,
WILLIAM WOOTON, both of Pierce College, Los Angeles, California
Published by JOHN WILEY & SONS, Inc.,
605 Third Avenue, New York 16, N.Y.

Programed text, 4500 frames, spiral bound, 752 pp., 8 1/2" x 11", $14.00. Available in 5 separate units at $2.85 each.
Teacher's Manual available, free.
Table of Contents.
Unit and Prerequisite Test(s) available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Jr.-sr. H.S. students, first year college students, tech. institute students, heterogeneous group of employees in industrial training program."
Prerequisites: 8th grade reading level, mastery of arithmetic (through fractions).
Average Time: 42-97 hours (est.).
Next Revision:
(4 sample pages)

MATHEMATICS-ALGEBRA

PROGRAMMED BEGINNING ALGEBRA
Drooyan, Wooton; JOHN WILEY & SONS, Inc.
4 sample pages

$x + 5 = 9$	272. "Find a number such that five more than the number is 9." This sentence is what is called a "word problem" or a "stated problem." It asks us to find a number that is subject to the condition that its sum with five is 9. This condition is expressed by the equation_______________.
Any letter will do for the variable.	
4	273. Solve $x + 5 = 9$.
is	274. Since five more than 4 is 9, 4 (is/is not) the solution of the word problem in Frame 272.
$4x + 1 = 29$	275. "If four times a certain number is increased by 1, the result is 29. What is the number?" Let x represent a number and write an equation representing the conditions on the number stated in the first sentence.
7	276. If the solution of $4x + 1 = 29$ is evident, write it directly. If the solution is not evident, transform the equation to an equivalent equation in which the solution is evident. The solution of $4x + 1 = 29$ is______.
$4x + 1 = 29$ $4x = 28$ $x = 7.$	
Yes	277. Does four times 7 increased by 1 equal 29?

Remark. While the quadratic formula offers a way to find the solutions of any quadratic equation, you generally resort to it only when you cannot find solutions an easier way. For example, if possible, it is more efficient to solve such an equation by factoring or by the extraction of roots.

factoring $x^2 - 3x - 4$ factors easily to $(x-4)(x+1)$.	**289.** The most efficient way to solve $x^2 - 3x - 4 = 0$ would be by (circle one) a) factoring b) extraction of roots c) formula
extraction of roots $x^2 - 8$ does not contain a linear term.	**290.** The most efficient way to solve $x^2 - 8 = 0$ would be by (circle one) a) factoring b) extraction of roots c) formula
factoring $2x^2 - 3x - 2$ factors to $(2x+1)(x-2)$.	**291.** The most efficient way to solve $2x^2 - 3x - 2 = 0$ would be by (circle one) a) factoring b) extraction of roots c) formula
formula	**292.** Since the left member of $2x^2 - 3x - 6 = 0$ will not factor, the way to solve the equation would be by (circle one) a) factoring b) extraction of roots c) formula

time

689. Suppose a freight train travels 120 miles in the same length of time an express train travels 180 miles, and suppose that the express travels 20 miles per hour faster than the freight; how fast must each be traveling? Since the time the trains travel is the same in each case, it seems reasonable to approach the problem by writing an equation relating the_________each travels.

$r + 20$

690. If r represents the rate of the freight, and if the express travels 20 miles per hour faster than the freight, the rate of the express is given in terms of r by_________.

$\frac{120}{r}$

$t = \frac{d}{r}$.

691. If the freight train travels 120 miles at a rate (r), the time it takes to do this can be represented by the expression _________.

$\frac{180}{r + 20}$

$t = \frac{d}{r}$.

692. If the express train travels 180 miles at a rate ($r + 20$), the time it takes to do this can be represented by the expression _________.

$\frac{120}{r} = \frac{180}{r + 20}$

693. The fact that the time traveled by the freight train and the time traveled by the express train is the same, can be expressed in terms of r by the equation _________ = _________.

40

694. The solution of $\frac{120}{r} = \frac{180}{r + 20}$ is_________.

Remark. This unit introduces a part of the vocabulary necessary for the successful study of algebra. The terms are introduced through a consideration of the numbers of arithmetic, and certain properties associated with these numbers.

set	**1.** Any collection of things is called a set. The letters in the English alphabet form a _____ .
set	**2.** The collection of coins in a man's pocket is a _____ .
8; 10; 12	**3.** Braces, $\{\ \}$, are used to identify a set. Thus, $\{1, 2, 3, 4, 5\}$ is the set of numbers 1, 2, 3, 4, and 5. Similarly, $\{8, 10, 12\}$ denotes the set of numbers ____, _____, and _____ .
member	**4.** Any one ot a collection of things in a set is called a member of the set. Thus, 3 is a __________ of $\{3, 4, 5\}$.
elements	**5.** A member of a set is also called an element of the set. Thus, 3, 4, and 5 are the members or the ______________ of $\{3, 4, 5\}$.

A PROGRAM IN CONTEMPORARY ALGEBRA
I Sets, Numbers and Language of Algebra
II Equations and Inequalities in One Variable
III Equations and Inequalities in Two Variables
IV Polynomial Expressions Relations and Functions
V Exponents, Radicals and Quadratic Equations
RALPH T. HEIMER, University of South Florida
FRANK KOCHER, Pennsylvania State University
JOHN J. LOTTES, State University College, Genesee, N. Y.
Published by HOLT, RINEHART AND WINSTON,
383 Madison Ave., N. Y. 17, N.Y.

Programed text, 3792 frames, paperback, 728 pp., 8-1/2" x 11", available in 5 separate volumes @ $1.20 each.
Teacher's Manual available, $.60.
Table of Contents, Index.
Unit and Final Test(s) available.
Constructed Responses usually used, some Multiple Choice, no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"High School and College students."
Other using population(s): "Inservice and preservice training of math teachers; College students with little previous math."
Prerequisites: "The program assumes a knowledge of the arithmetic of positive integers, but no previous study of algebra is required."
Average Time: 32-1/2 hours (est.).
Next Revision: unknown
(2 sample pages)

MATHEMATICS-ALGEBRA

A PROGRAM IN CONTEMPORARY ALGEBRA
Heimer, Kocher, Lottes; HOLT, RINEHART AND WINSTON
2 sample pages

25

INTEGER

26

Every natural number is an integer. Is every integer a natural number? ______

• • •　　　　　　• • •

26

NO

For example, (−1) is an integer, but it is not a natural number.

27

The number 0 is an integer. Is it a natural number? ______

• • •　　　　　　• • •

27

NO

28

The additive inverse of 7 is ______.

• • •　　　　　　• • •

28

(−7)

29

Is the additive inverse of 7 an integer? ______

• • •　　　　　　• • •

29

YES

30

The additive inverse of (−5) is the number ______

Is the additive inverse of (−5) an integer? ______

• • •　　　　　　• • •

30

5; YES

31

The number (−1) is

(a) an integer　　(c) both (a) and (b)
(b) a natural number　　(d) neither (a) nor (b)

______

• • •　　　　　　• • •

31

(a) AN INTEGER

128

Every real number except 0, then, is either ______ or ______

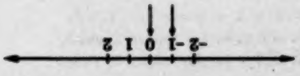
• • •　　　　　　• • •

128

POSITIVE } either order
NEGATIVE }

129

Which is greater, 0 or (−1)? ______



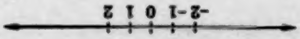
• • •　　　　　　• • •

129

0

130

Notice that, on the number line, 0 appears to the ______ of (−1).



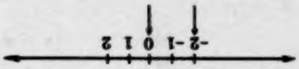
• • •　　　　　　• • •

130

RIGHT

131

Which is greater, 0 or (−2)? ______



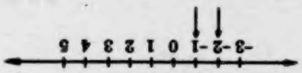
• • •　　　　　　• • •

131

0

132

Which is greater, (−1) or (−2)? ______



• • •　　　　　　• • •

132

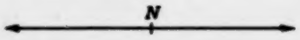
(−1)

14

REAL; LESS

15

If $x > N$, then the point whose coordinate is x appears on the number line to the __________ of the point whose coordinate is N.

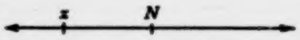


● ● ● ● ● ●

15

RIGHT

16



If the point whose coordinate is x appears to the left of the point whose coordinate is N, then x _____ N. ($<$ or $>$?)

● ● ● ● ● ●

16

$x < N$

17

The word "arithmetic" is normally construed to mean the study of certain numbers under the operations of addition, subtraction, multiplication, and division.

We shall undertake a study of the arithmetic of real numbers; that is, study the real numbers under the operations of addition, subtraction, multiplication, and division.

GO TO NEXT FRAME

18

We know how to add two positive numbers. For example,

$$2 + 3 = 5 \text{ and } 1 + 7 = 8.$$

5 is said to be the sum of 2 and 3.

8 is said to be the _____ of 1 and 7.

● ● ● ● ● ●

18

SUM

128

$$(-3)\cdot y \geq 6$$

Multiplying each member of this inequality by $(-\frac{1}{3})$, we get the equivalent inequality

$$(-\tfrac{1}{3})\cdot(-3)\cdot y \ \_\_\_\_ \ (-\tfrac{1}{3})\cdot 6$$

or

$$y \ \_\_\_\_ \ (-2).$$

● ● ● ● ● ●

128

$\leq$; $\leq$

129

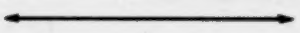
Find and graph the solution set for

$$(-3)\cdot y \geq 6,$$

keeping in mind the fact that this inequality is equivalent to

$$y \leq (-2).$$

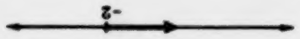
SS = ______



● ● ● ● ● ●

129

SS = $(-\infty, -2]$



130

Find and graph the solution set for

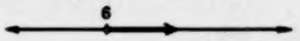
$$2x \leq 18.$$

SS = ______

● ● ● ● ● ●

130

SS = $(-\infty, 9]$



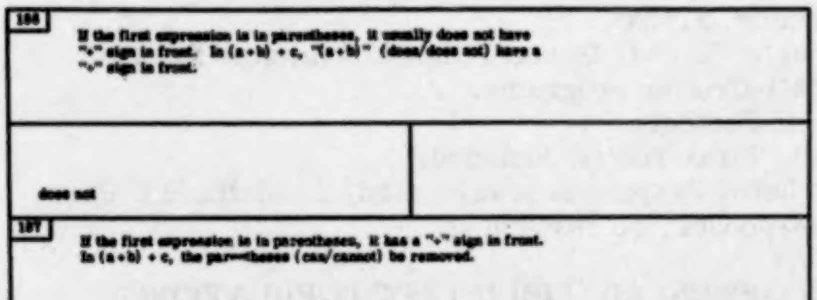
SECONDARY MATHEMATICS SERIES - ALGEBRA REFRESHER
CHARLOTTE YESSELMAN, Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION:
575 Lexington Avenue, New York 22, N.Y.

Programed text, 3,313 frames, paperback, 752 pp., 8-1/2" x 11", bound in 4 separate volumes, $16.00.
For use in MIN/MAX II machine, $25.00; program reusable, $15.00.
Teacher's Manual: General Manual available for all TMI-Grolier programs.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "High school graduates who had studied one year of Algebra."
Prerequisites: "Ability to read at 8th grade level and to add, subtract, divide and multiply whole numbers, fractions and decimals."
Average Time: 30-50 hours (based entirely on data).
Next Revision: December, 1963.
(2 sample pages)

MATHEMATICS-ALGEBRA

SECONDARY MATHEMATICS SERIES – ALGEBRA REFRESHER
Yesselman; TEACHING MATERIALS CORPORATION
2 sample pages



186

If the first expression is in parentheses, it usually does not have "+" sign in front. In $(a+b)+c$, "$(a+b)$" (does/does not) have a "+" sign in front.

does not

187

If the first expression is in parentheses, it has a "+" sign in front. In $(a+b)+c$, the parentheses (can/cannot) be removed.

can

188

$-(a+b)$ means the same thing as $-1(a+b)$. By the distributive law
$-1(a+b) = -1a - 1b = -a - b$.
$-(a-b)$ means the same thing as $-1(a-b)$. By the distributive law
$-1(a-b) = -1a - 1(-b) = ***$

$-a+b$

189

By the distributive law: To remove parentheses with "-" sign in front, change all "+" signs inside to "-". $a-(b+c) = a-b-c$

Also: $x-(y+z) = ***$

$x-y-z$

190

$r-(x+s) = ***$ (Remove parentheses)

$r+(x+s) = ***$ (Remove parentheses)

$(r-x)+s = ***$ (Remove parentheses)

$r-x-s$ $r+x+s$ $r-x+s$

2-30

6

$x = y + 2$
If $y = -3$, $x = -1$
If $y = -1$, $x =$
If $y = 0$, $x =$
If $y = 1$, $x =$

1
2
3

7 Make a table for the equation: $x = 2y$.

If $y = -1$, $x = -2$

Fill in the table. ←

x	y
-2	-1
0	0
2	1
4	2

x	y
-2	-1
	0
	1
	2

8

$y = \frac{x}{2} - 4$

If $x = -2$, $y = \frac{-2}{2} - 4 = -1 - 4 = -5$

Fill in the table. ←

x	y
-2	-5
0	-4
2	-3
4	-2

x	y
-2	
0	
2	
4	

9

$x = \frac{3y}{2} - 2$

If $y = -1$, $x = \frac{3(-1)}{2} - 2 = \frac{-3}{2} - \frac{2}{1} = \frac{-3}{2} - \frac{4}{2} = \frac{-7}{2} = -3\frac{1}{2}$

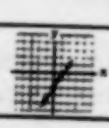
Fill in the table. ←

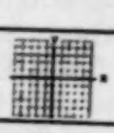
x	y
$-3\frac{1}{2}$	-1
-2	0
$-\frac{1}{2}$	1
1	2

x	y
$-3\frac{1}{2}$	-1
	0
	1
	2

10 Plot and connect in order. ←

x	y
-1	$-3\frac{1}{2}$
0	-2
1	$-\frac{1}{2}$
2	1





9-2

MATHEMATICS-ALGEBRA Jr. H.S.+

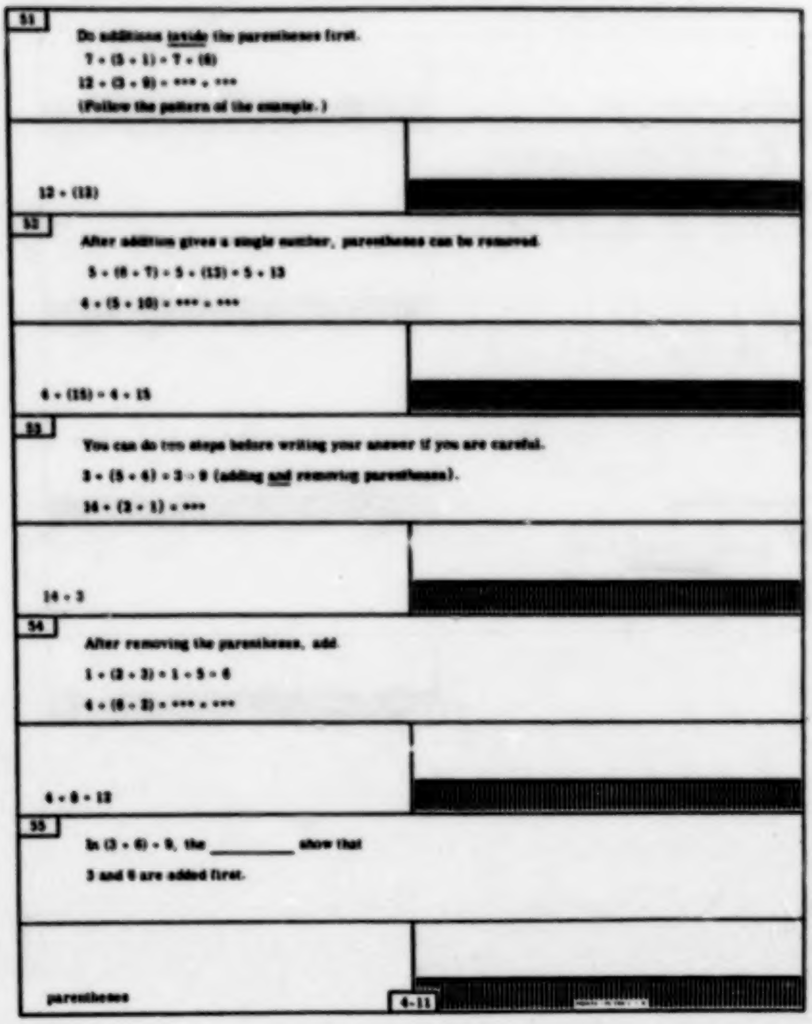
SECONDARY MATHEMATICS SERIES: FUNDAMENTALS OF ALGEBRA
Part I and Part II
JAMES L. EVANS
CHARLOTTE YESSELMAN, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION, 575 Lexington Avenue, New York 22, N.Y.

Programed texts; Part I, 1,933 frames; Part II, 4,385 frames; paperbacks; Part I, 462 pp.; Part II, 927 pp.; 8-1/2" x 11"; Part I, bound in 2 separate volumes, $11.00; Part II, bound in 4 separate volumes, $16.00.
For use in MIN/MAX II machines, $25.00; programs reusable, Part I: $10.00, Part II, $15.00.
Teacher's Manual: General Manual for all TMI-Grolier programs available
Unit Test(s) included (Part I) Final Test included (Part I & Part II).
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Part I: "Eighth graders having no prior Algebra background - average age 13 years 6 months."
Part II: "Eighth grade students who have completed FUNDAMENTALS OF ALGEBRA, Part I - average age 13.5"
Other using population(s): "Brush up for those having had beginning Algebra."
Prerequisites: "Ability to read at 8th-grade level and to add, subtract, divide and multiply whole numbers, fractions, and decimals."
Average Time: Part I: 15-25 hours (based entirely on data); standard deviation, 7.07 hours. Part II: 30-50 hours (based entirely on data); standard deviation, 29.0 hours.
Next Revision: Part I: April, 1963. Part II: March, 1963.
(6 sample pages)

MATHEMATICS-ALGEBRA

SECONDARY MATHEMATICS SERIES: FUNDAMENTALS OF ALGEBRA
Evans, Yesselman; TEACHING MATERIALS CORPORATION
6 sample pages



51

Do additions inside the parentheses first.
7 + (5 + 1) = 7 + (6)
12 + (3 + 9) = *** + ***
(Follow the pattern of the example.)

12 + (12)

52

After addition gives a single number, parentheses can be removed.
5 + (6 + 7) = 5 + (13) = 5 + 13
4 + (5 + 10) = *** + ***

4 + (15) = 4 + 15

53

You can do two steps before writing your answer if you are careful.
3 + (5 + 4) = 3 + 9 (adding and removing parentheses).
16 + (2 + 1) = ***

16 + 3

54

After removing the parentheses, add.
1 + (2 + 3) = 1 + 5 = 6
4 + (6 + 2) = *** + ***

4 + 8 = 12

55

In (3 + 6) + 9, the __________ show that
3 and 6 are added first.

parentheses

4-11

16

In 17r, r is the coefficient of 17.

In 36c, *** is the coefficient of c.

36

17

If a product has a single arithmetic number for a factor, that number is called a NUMERICAL COEFFICIENT of the other factors. In 3r, 3 is the ___________ ___ ________ of r.

The numerical coefficient of 78x is ***.

numerical coefficient 78

18

A numerical coefficient can be a fraction.

In $\frac{1}{3}x$, the numerical coefficient is $\frac{1}{3}$.

What is the numerical coefficient in $\frac{1}{7}x$? ***

$\frac{1}{7}$

19

In $\frac{3}{5}x$, $\frac{3}{5}$ is the __________ __________

numerical coefficient

20

$\frac{1}{2}x$ can be written $\frac{1 \cdot x}{2}$ or $\frac{x}{2}$.

Similarly, $\frac{x}{3}$ can be written $\frac{1}{3}x$.

Write $\frac{x}{2}$ with a fractional coefficient. ***

$\frac{1}{2}x$

S-4

51 You are going to learn an easy way to take square roots, using the Table of Approximate Square Roots. Table I shows the square _____ of numbers from 1 to 1000. (Ask your instructor for table I.)

roots

52 In table I, some columns are labeled "N." Other columns are labeled "$\sqrt{N}$." If you find a number in a column labeled "N," you can guess that the square root of that number is next to it in a column labeled ***.

$\sqrt{N}$

53 Look on the first page of table I.

When N is 1, $\sqrt{N}$ is 1.000.

When N is 2, $\sqrt{N}$ is 1.414.

When N is 3, $\sqrt{N}$ is ***.

1.732

54 $\sqrt{4} = 2.000$

$\sqrt{6} =$ ***

2.449

55 $\sqrt{47} =$ ***

$\sqrt{196} =$ ***

TEST

2-11

246

$\sqrt{\frac{16}{9x^2}} = \frac{\sqrt{16}}{\sqrt{9x^2}} = \frac{4}{3x}$ $\sqrt{\frac{25y^4}{36x^2}} = \frac{\sqrt{25y^4}}{\sqrt{36x^2}} = \dots$

$\frac{5y^2}{6x}$

247

$\frac{\sqrt{64}}{\sqrt{4}} = \frac{8}{2} = 4$ $\sqrt{\frac{64}{4}} = \sqrt{16} = 4$

In other words, $\frac{\sqrt{64}}{\sqrt{4}} = \sqrt{\frac{\dots}{\dots}}$

$\sqrt{\frac{64}{4}}$

$\sqrt{-}$

248 If the expression under the square root sign is a perfect square, you may leave off the square root sign only after taking the square root of the expression. $9x^2$ is a perfect square, so you can express $\sqrt{9x^2}$ as $3x$. You cannot express $\sqrt{9x^2}$ as just $9x^2$. Express $\sqrt{16y^2}$ without the square root sign. ...

$4y$

249 If the expression under the square root sign is a perfect square, and you write its square root, you do not use the square root sign.

$\sqrt{9} = 3$; it is not $= \sqrt{3}$. $\sqrt{25} = \dots$

5

250

$\sqrt{16x^2} =$ ($\sqrt{4x}$ / $4x$ / $4\sqrt{x}$ / None of these)

$4x$

[illegible]

96 In some fractions it may be necessary to factor before we can cancel.

$\frac{2a+2b}{2} = \frac{2(a+b)}{2} = \frac{\cancel{2}(a+b)}{\cancel{2}} = a+b$ (removing a common monomial factor) (cancelling) (reducing)

$\frac{5c+5d}{c+d} = \ldots = \ldots$ (factoring, cancelling, and reducing)

$\frac{5c+5d}{c+d} = \frac{5\cancel{(c+d)}}{\cancel{(c+d)}} = 5$

97 Factor this fraction and reduce to lowest terms.

$\frac{3x^2+5x}{3x} = \ldots$

Did you factor first?

$\frac{\cancel{x}(3x+5)}{3\cancel{x}} = \frac{3x+5}{3}$

98 Factor and reduce: $\frac{7b+7a}{ca+cb} = \ldots$

$\frac{7\cancel{(b+a)}}{c\cancel{(a+b)}} = \frac{7}{c}$

99 Factor and reduce: $\frac{2ax+2ay}{(x+y)} = \ldots$

$\frac{2a\cancel{(x+y)}}{\cancel{(x+y)}} = 2a$

100 Factor and reduce if possible.

A. $\frac{5a-15b}{10ax} = \ldots$ B. $\frac{4b+8c}{9bc} = \ldots$

A. $\frac{\cancel{5}(a-3b)}{\underset{2}{\cancel{10}}ax} = \frac{a-3b}{2ax}$ B. $\frac{4(b+2c)}{9bc}$

A.

B.

6-20

526 The L.C.D. of $\frac{3}{7\cdot 5r^2} - \frac{5}{7\cdot 2rs}$ is $7\cdot 5\cdot 2\cdot r^2\cdot s$. The denominator of $\frac{3}{7\cdot 5\cdot r^2}$ does not have the factors 2 and s which are found in the L. C. D. The denominator of $\frac{5}{7\cdot 2\cdot r\cdot s}$ does not have the factors r^2 and ••• which are found in the L. C. D.

s

527 The L. C. D. of $\frac{1}{2\cdot 5} + \frac{1}{5\cdot 3}$ is $2\cdot 3\cdot 5$. We must multiply the numerator and denominator of $\frac{1}{2\cdot 5}$ by 3, the missing factor, to get a like fraction: $\frac{1\cdot 3}{2\cdot 5\cdot 3} = \frac{3}{2\cdot 5\cdot 3}$. $\frac{1\cdot \cdots}{5\cdot 3\cdot \cdots} = \frac{2}{2\cdot 5\cdot 3}$

What factor of the L. C. D. was missing in the denominator of $\frac{1}{5\cdot 3}$? •••

$\frac{1\cdot 2}{5\cdot 3\cdot 2} = \frac{2}{2\cdot 5\cdot 3}$

528 The L. C. D. of $\frac{1}{7\cdot 3^2\cdot y} + \frac{1}{2\cdot x^3}$ is $7\cdot 3^2\cdot 2\cdot x^3\cdot y$.

$\frac{1\cdot 2x^3}{7\cdot 3^2\cdot y\cdot \underset{\uparrow}{2x^3}} = \frac{2x^3}{7\cdot 3^2\cdot 2\cdot x^3\cdot y}$ (missing factors) $\qquad \frac{1\cdot \cdots}{2x^3\cdot \underset{\uparrow}{\cdots}} = \frac{7\cdot 3^2\cdot y}{7\cdot 3^2\cdot 2\cdot x^3\cdot y}$ (missing factors)

$\frac{1\cdot 7\cdot 3^2\cdot y}{2x^3\cdot 7\cdot 3^2\cdot y} = \frac{7\cdot 3^2\cdot y}{7\cdot 3^2\cdot 2\cdot x^3\cdot y}$

529 $\frac{3}{a^2bc^3} - \frac{4}{a^3bc^2}$ L. C. D. $= a^3bc^3$

$\frac{3\cdot a}{a^2bc^3\cdot a} = \frac{3a}{a^3bc^3}$ $\qquad \frac{4\cdot \cdots}{a^3bc^2\cdot \underset{\uparrow}{\cdots}} = \frac{\cdots}{a^3bc^3}$ (missing factor(s))

$\frac{4\cdot c}{a^3bc^2\cdot c} = \frac{4c}{a^3bc^3}$

530 What method would you use to add: $\frac{3}{5y}$ and $\frac{4}{10y^2}$? ____________________________

L. C. D.

MATHEMATICS – ALGEBRA Jr. H.S.

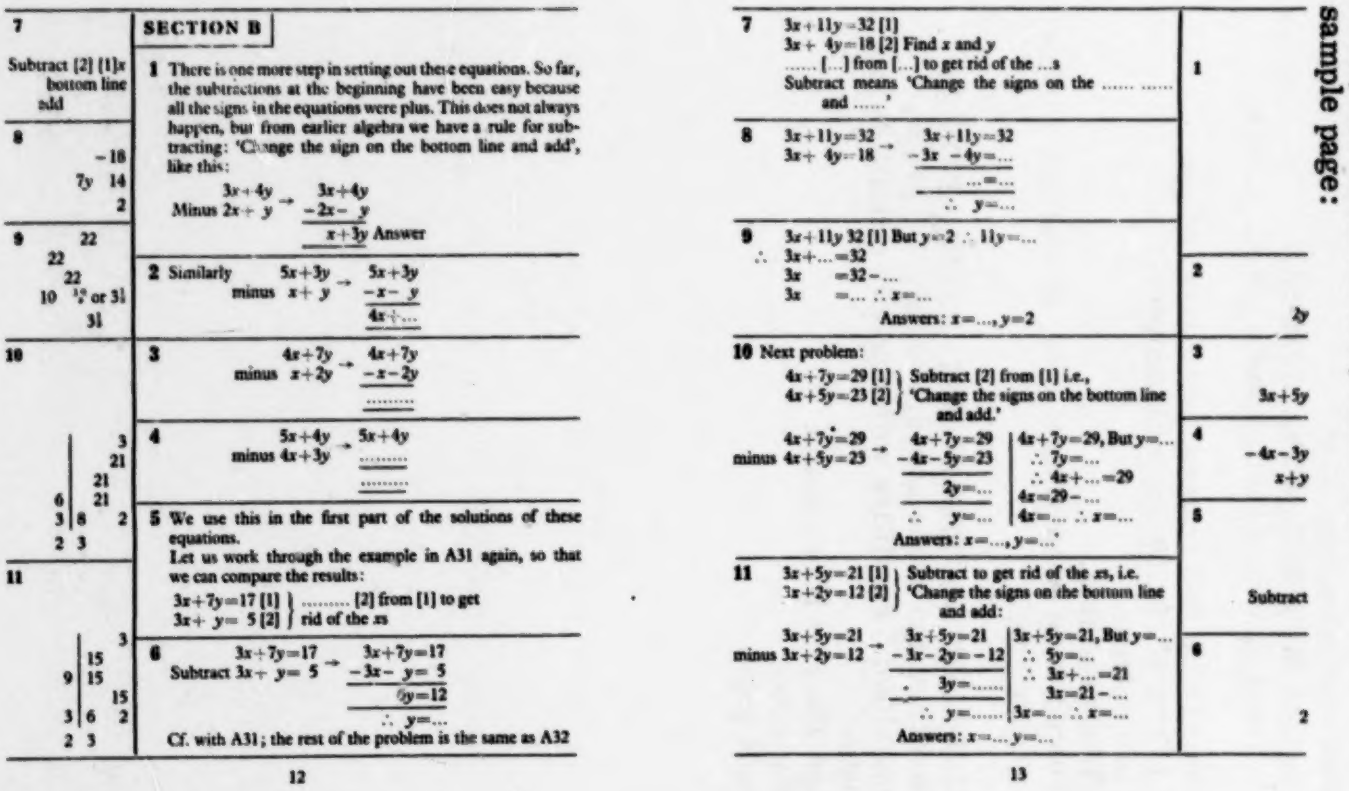
SIMULTANEOUS EQUATIONS
K. AUSTWICK, Research Unit, Education Department,
Sheffield University, U.K.
Published by METHUEN & CO., LIMITED
36 Essex Street, Strand, London. W.C. 2., U.K.

Programed text, 140 frames, soft cover, 40 pp.,
6 1/2" x 8", $1.50 (approximately).
Table of Contents.
Final Test available.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Average and above average ability 7-8 grade.
Prerequisites: "Facilities with negative quantities and signs."
Average Time: 4 hours (est.).
Next Revision:
(1 sample page)

MATHEMATICS – ALGEBRA

SIMULTANEOUS EQUATIONS
Austwick; METHUEN & CO., LIMITED
one sample page:



7

Subtract [2] [1]x
bottom line
add

8

−18
7y 14
2

9

22
22
22
10 $\frac{10}{3}$ or $3\frac{1}{3}$
$3\frac{1}{3}$

10

3
21
21
6 | 21
3 | 8 2
2 3

11

3
15
9 | 15
15
3 | 6 2
2 3

SECTION B

1 There is one more step in setting out these equations. So far, the subtractions at the beginning have been easy because all the signs in the equations were plus. This does not always happen, but from earlier algebra we have a rule for subtracting: 'Change the sign on the bottom line and add', like this:

$$\begin{array}{rr} & 3x+4y \\ \text{Minus} & 2x+y \end{array} \rightarrow \begin{array}{r} 3x+4y \\ \underline{-2x-y} \\ \underline{x+3y} \end{array} \text{ Answer}$$

2 Similarly

$$\begin{array}{rr} & 5x+3y \\ \text{minus} & x+y \end{array} \rightarrow \begin{array}{r} 5x+3y \\ \underline{-x-y} \\ \underline{4x+\dots} \end{array}$$

3

$$\begin{array}{rr} & 4x+7y \\ \text{minus} & x+2y \end{array} \rightarrow \begin{array}{r} 4x+7y \\ \underline{-x-2y} \\ \underline{\dots\dots\dots} \end{array}$$

4

$$\begin{array}{rr} & 5x+4y \\ \text{minus} & 4x+3y \end{array} \rightarrow \begin{array}{r} 5x+4y \\ \underline{\dots\dots\dots} \\ \underline{\dots\dots\dots} \end{array}$$

5 We use this in the first part of the solutions of these equations.
Let us work through the example in A31 again, so that we can compare the results:

$$\left.\begin{array}{l} 3x+7y=17\ [1] \\ 3x+y=5\ [2] \end{array}\right\} \begin{array}{l} \dots\dots\dots\ [2] \text{ from } [1] \text{ to get} \\ \text{rid of the } x\text{s} \end{array}$$

6

$$\begin{array}{rr} & 3x+7y=17 \\ \text{Subtract} & 3x+y=5 \end{array} \rightarrow \begin{array}{r} 3x+7y=17 \\ \underline{-3x-y=5} \\ \underline{6y=12} \\ \therefore\ y=\dots \end{array}$$

Cf. with A31; the rest of the problem is the same as A32

12

7

$3x+11y=32$ [1]
$3x+4y=18$ [2] Find x and y
…… […] from […] to get rid of the …s
Subtract means 'Change the signs on the …… …… and ……'

8

$$\begin{array}{r} 3x+11y=32 \\ 3x+4y=18 \end{array} \rightarrow \begin{array}{r} 3x+11y=32 \\ \underline{-3x-4y=\dots} \\ \underline{\dots=\dots} \\ \therefore\ y=\dots \end{array}$$

9

$3x+11y$ 32 [1] But $y=2$ $\therefore$ $11y=\dots$
$\therefore$ $3x+\dots=32$
$3x=32-\dots$
$3x=\dots$ $\therefore$ $x=\dots$

Answers: $x=\dots, y=2$

10 Next problem:

$$\left.\begin{array}{l} 4x+7y=29\ [1] \\ 4x+5y=23\ [2] \end{array}\right\} \begin{array}{l} \text{Subtract [2] from [1] i.e.,} \\ \text{'Change the signs on the bottom line} \\ \text{and add.'} \end{array}$$

$$\begin{array}{rr} & 4x+7y=29 \\ \text{minus} & 4x+5y=23 \end{array} \rightarrow \begin{array}{r} 4x+7y=29 \\ \underline{-4x-5y=23} \\ \underline{2y=\dots} \\ \therefore\ y=\dots \end{array} \left| \begin{array}{l} 4x+7y=29, \text{But } y=\dots \\ \therefore\ 7y=\dots \\ \therefore\ 4x+\dots=29 \\ 4x=29-\dots \\ 4x=\dots\ \therefore\ x=\dots \end{array}\right.$$

Answers: $x=\dots, y=\dots$'

11

$$\left.\begin{array}{l} 3x+5y=21\ [1] \\ 3x+2y=12\ [2] \end{array}\right\} \begin{array}{l} \text{Subtract to get rid of the } x\text{s, i.e.} \\ \text{'Change the signs on the bottom line} \\ \text{and add:} \end{array}$$

$$\begin{array}{rr} & 3x+5y=21 \\ \text{minus} & 3x+2y=12 \end{array} \rightarrow \begin{array}{r} 3x+5y=21 \\ \underline{-3x-2y=-12} \\ \underline{3y=\dots\dots} \\ \therefore\ y=\dots\dots \end{array} \left| \begin{array}{l} 3x+5y=21, \text{But } y=\dots \\ \therefore\ 5y=\dots \\ \therefore\ 3x+\dots=21 \\ 3x=21-\dots \\ 3x=\dots\ \therefore\ x=\dots \end{array}\right.$$

Answers: $x=\dots\ y=\dots$

1

2

$2y$

3

$3x+5y$

4

$-4x-3y$
$x+y$

5

Subtract

6

2

13

MATHEMATICS – ALGEBRA Jr. H.S.-H.S.

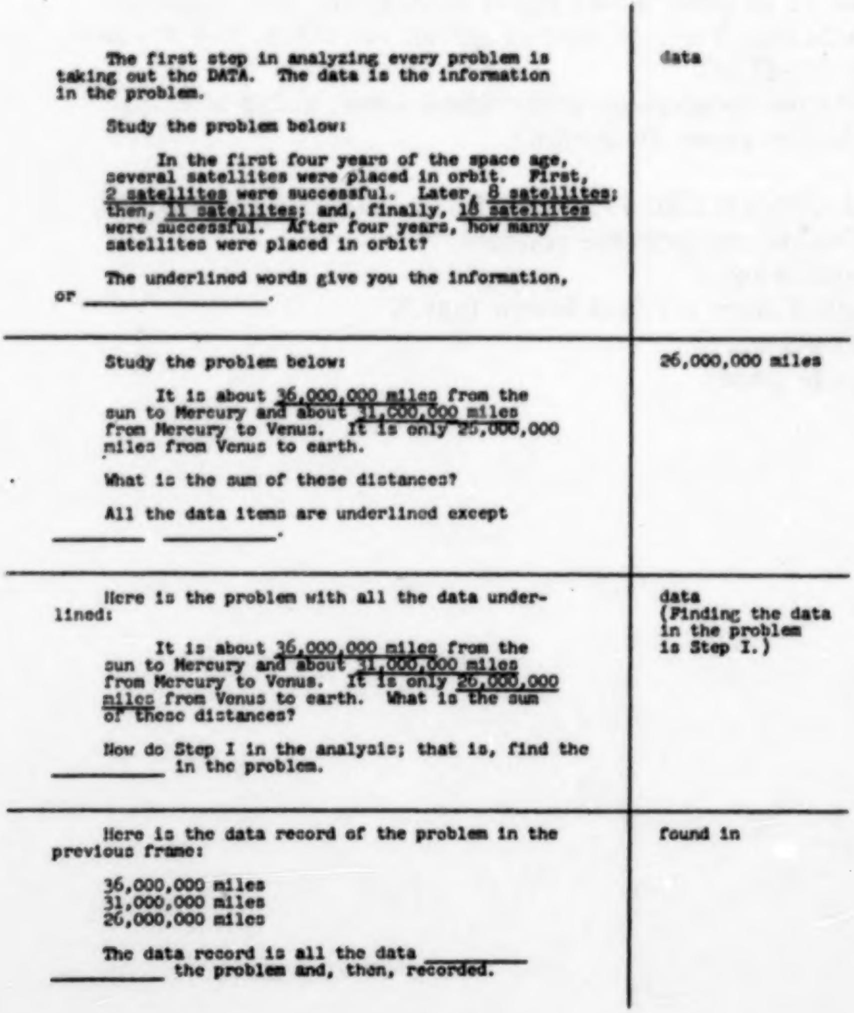
SOLVING ARITHMETIC WORD PROBLEMS
Be a Problem Analyst
DIANE CUMMINGS, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.) including 3 programs; program reusable, 200 frames, $2.00-$2.50.
Constructed Responses sometimes used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

MATHEMATICS – ALGEBRA

SOLVING ARITHMETIC WORD PROBLEMS
Cummings; HONOR PRODUCTS COMPANY
one sample page:



The first step in analyzing every problem is taking out the DATA. The data is the information in the problem. Study the problem below: In the first four years of the space age, several satellites were placed in orbit. First, 2 satellites were successful. Later, 8 satellites; then, 11 satellites; and, finally, 18 satellites were successful. After four years, how many satellites were placed in orbit? The underlined words give you the information, or ________________.	data
Study the problem below: It is about 36,000,000 miles from the sun to Mercury and about 31,000,000 miles from Mercury to Venus. It is only 25,000,000 miles from Venus to earth. What is the sum of these distances? All the data items are underlined except ________ __________.	26,000,000 miles
Here is the problem with all the data underlined: It is about 36,000,000 miles from the sun to Mercury and about 31,000,000 miles from Mercury to Venus. It is only 26,000,000 miles from Venus to earth. What is the sum of these distances? Now do Step I in the analysis; that is, find the __________ in the problem.	data (Finding the data in the problem is Step I.)
Here is the data record of the problem in the previous frame: 36,000,000 miles 31,000,000 miles 26,000,000 miles The data record is all the data __________ __________ the problem and, then, recorded.	found in

MATHEMATICS - ALGEBRA Coll.

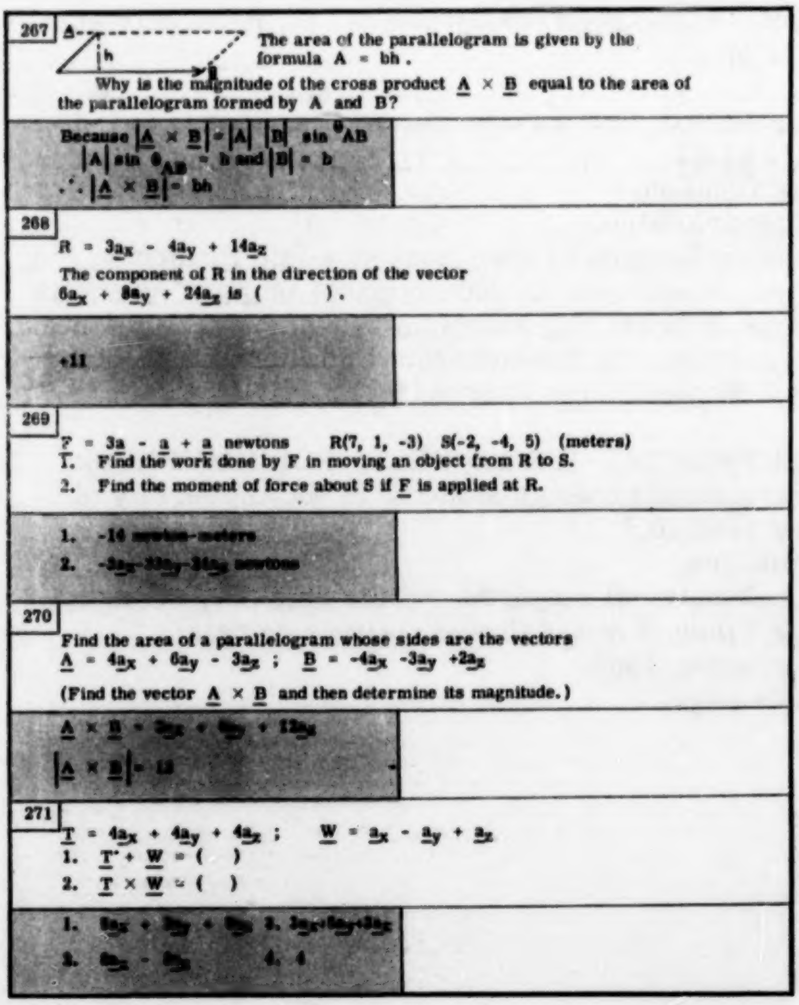
VECTOR ALGEBRA
R. K. MOORE, Programer
HENRY C. ELLIS, Programer
HOWARD LINDBERG, Programer
AMARYLLIS D. HUNT, Editor
Published by GENERAL PROGRAMMED TEACHING
CORPORATION, 1719 Girard, N. E., Albuquerque,
New Mexico

Programed text, 353 frames, paperback, 71 pp., 8-1/2" x 11", $1.75.
Table of Contents.
Final test available.
Constructed Responses always used; some Branching ("A linear supplement in determinants is supplied and is a type of branching known as branching-within-linear programing, as distinct from Crowderian branching); no Multiple Choice Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Engineering college students at the University of New Mexico."
Prerequisites:
Additional material required: "Slide rule may be useful."
Average Time: 5 hours (based entirely on data).
Next Revision: 1968.
(1 sample page)

MATHEMATICS – ALGEBRA

VECTOR ALGEBRA
Moore, Ellis, Lindberg, Hunt; GENERAL PROGRAMMED TEACHING CORPORATION
one sample page:



267

The area of the parallelogram is given by the formula $A = bh$.

Why is the magnitude of the cross product $\underline{A} \times \underline{B}$ equal to the area of the parallelogram formed by A and B?

Because $|\underline{A} \times \underline{B}| = |A|\ |B|\ \sin\theta_{AB}$

$|A| \sin\theta_{AB} = h$ and $|B| = b$

$\therefore |\underline{A} \times \underline{B}| = bh$

268

$R = 3\underline{a}_x - 4\underline{a}_y + 14\underline{a}_z$

The component of R in the direction of the vector $6\underline{a}_x + 8\underline{a}_y + 24\underline{a}_z$ is (   ).

+11

269

$\underline{F} = 3\underline{a} - \underline{a} + \underline{a}$ newtons   R(7, 1, -3) S(-2, -4, 5) (meters)

1. Find the work done by F in moving an object from R to S.
2. Find the moment of force about S if $\underline{F}$ is applied at R.

1. -14 newton-meters
2. $-3\underline{a}_x - 33\underline{a}_y - 24\underline{a}_z$ newtons

270

Find the area of a parallelogram whose sides are the vectors

$\underline{A} = 4\underline{a}_x + 6\underline{a}_y - 3\underline{a}_z$; $\underline{B} = -4\underline{a}_x - 3\underline{a}_y + 2\underline{a}_z$

(Find the vector $\underline{A} \times \underline{B}$ and then determine its magnitude.)

$\underline{A} \times \underline{B} = 3\underline{a}_x + 4\underline{a}_y + 12\underline{a}_z$

$|\underline{A} \times \underline{B}| = 13$

271

$\underline{T} = 4\underline{a}_x + 4\underline{a}_y + 4\underline{a}_z$; $\underline{W} = \underline{a}_x - \underline{a}_y + \underline{a}_z$

1. $\underline{T} + \underline{W} = (\quad)$
2. $\underline{T} \times \underline{W} = (\quad)$

1. $5\underline{a}_x + 3\underline{a}_y + 5\underline{a}_z$ 3. $3\underline{a}_x + 6\underline{a}_y + 3\underline{a}_z$
2. $8\underline{a}_x - 8\underline{a}_z$ 4. 4

APPLIED MATHEMATICS Jr. H.S.-Coll.

THE ARITHMETIC OF COMPUTERS
NORMAN A. CROWDER, Vice President and Technical Director, U.S.I. Educational Science Division.
Published by: DOUBLEDAY & COMPANY, INC.,
575 Madison Avenue, N.Y.C.
British edition—THE ENGLISH UNIVERSITIES PRESS LIMITED.

Programed text, 448 frames, hard cover, 469 pp., 8 1/4" x 5 3/8", $4.95.
(A similar program, INTRODUCTION TO COMPUTER MATHEMATICS, is available in TM format from: EDUCATIONAL SCIENCE DIVISION, U.S. INDUSTRIES, INC.,
250 Park Avenue, N.Y.C.
For use in AUTOTUTOR MARK II, $1,250; program reusable, $100.00.)
Table of Contents, both programs; Index, programed text.
Unit Test(s) included.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Average Time: 10-12 hours for text, 8-20 hours machine version. (est.)
Next Revision: "None scheduled."
(1 sample page)

APPLIED MATHEMATICS

THE ARITHMETIC OF COMPUTERS
Crowder; DOUBLEDAY & DOMPANY, INC.
one sample page

Sample from The Arithmetic of Computers

29
(from page 10)

YOUR ANSWER: $3^4 = 3 \times 3 \times 3 \times 3 = 81$.

You are correct. The symbol 3^4 means "the product formed by using 3 as a factor four times."

You can form an entire series of products by using a particular number as a factor twice, three times, four times, etc. These products are called the powers of the number. Thus:

$2 \times 2 = 2^2 = 4$, **which is the 2nd power of 2,**

$2 \times 2 \times 2 = 2^3 = 8$, **which is the 3rd power of 2,**

$2 \times 2 \times 2 \times 2 = 2^4 = 16$, **which is the 4th power of 2,**

and so on.

2^2 can also be called "2 raised to the 2nd power," 2^3 can also be called "2 raised to the 3rd power," and so on.

The 2nd power of 3, that is, 3 raised to the 2nd power, would be the number formed by using 3 as a factor twice.

What would 5 raised to the 2nd power be?

The 2nd power of 5 $= 5 \times 2 = 10$.	page 12
The 2nd power of 5 $= 5^2 = 5 \times 5 = 25$.	page 24
The 2nd power of 5 $= 2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$.	page 32

ARITHMETIC FOR NURSES
MARILYN FERSTER, R.N.
Published by SPRINGER PUBLISHING COMPANY, Inc.,
44 East 23rd Street, New York 10, N.Y.

Programed text, 667 frames, paperback, 112 pp.,
6 3/4" x 10", $2.50.
Table of Contents.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"60 nursing students in Pittsburgh, Pa. area hospitals."
Prerequisites:
Average Time: 15 hours (est.).
Next Revision: "Not now planned."
(1 sample page)

APPLIED MATHEMATICS

ARITHMETIC FOR NURSES
Ferster; SPRINGER PUBLISHING COMPANY, Inc.
one sample page:

F. **Multiplication of decimal numbers is even simpler when one of the factors is 10 or any multiple of 10, because then you can use a short cut.**

Rule:

> **Move the decimal point in one factor one place to the right for every 0 in the 10 (or multiple-of-10) factor.**

Example: **Multiply 25.3 by 1000.**

short cut — ***regular method***

$$25.3 \times \underbrace{1000}_{\text{3 zeroes}} = 25300 \longleftarrow \text{compare} \longrightarrow \begin{array}{r} 25.3 \\ \underline{1000} \\ 25300.\cancel{0} \end{array}$$

In the short-cut method, you have to move the decimal point in 25.3 3 places to the right because 1000 has 3 zeroes. In order to do this, 2 zeroes are added to the right of 3. Look at the results using either method. Are they the same? ☐

F.1. **Multiply 0.0939 by 100.**

$$0.0939 \times \underbrace{100}_{\text{2 zeroes}} = \boxed{}$$

Because one of the factors, 100, is a multiple of 10, you can use the short cut to multiply. Move the decimal point in 0.0939, 2 places to the right since 100 has 2 zeroes. Put the product in the double-line box.

F.2. **For practice, use the short cut to multiply these factors.**

(a) 5.63 × 1000 = ☐ (b) 42.09 × 100 = ☐

(c) 0.0009 × 100 = ☐ (d) 0.50 × 10,000 = ☐

ANSWERS:
F. Yes
F.1. 9.39
F.2. (a) 5630, (b) 4209, (c) 0.09, (d) 5000

APPLIED MATHEMATICS H.S.-Adult

BASIC COMPUTER PROGRAMMING
THEODORE G. SCOTT, U.S.I. Educational Science Division
Published by DOUBLEDAY & COMPANY, Inc.
575 Madison Avenue, New York, New York

Programed text, 457 frames, hard cover, 490 pp., 8-1/4" x 5-3/8", $5.95.

A similar program, COMPUTERS, A Four-Part Course in Programming, is available in TM format from EDUCATIONAL SCIENCE DIVISION, U.S. INDUSTRIES, Inc., 250 Park Avenue, New York, New York.

For use in AUTOTUTOR MARK II, $1,250; program reusable, available in 4 separate parts @ $100 each; combination I-IV, $375.00.

Table of Contents, both programs; Index, programed text.

Unit Test(s) included, both programs; Final Test included machine program.

Multiple Choice Responses, and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"High school graduates in business education; adult education courses."

Prerequisites: High school education.

Additional Equipment: Pencil, paper, machine program.

Average Time: 12-14 hours (est.) programed text; 24-40 hours, machine.

Next Revision:

(1 sample page) **457**

APPLIED MATHEMATICS

BASIC COMPUTER PROGRAMMING
Scott; DOUBLEDAY & COMPANY, Inc.
one sample page:

Sample from Basic Computer Programming

6
(from page 18)

YOUR ANSWER: The number −365 would appear in a memory cell as 1 0000000365.

Right. The decimal point is located at the extreme right of each cell. Thus, all whole numbers must be located in the right-hand positions. The sign digit (here 1, since −365 is a negative number) is located in the left-hand position of a cell.

Now let's have some practice coding numbers.

Here are three groups of numbers. Each number is followed by the corresponding TUTAC word. One number in one of these three groups is coded incorrectly. Which group contains the error?

921, 165	0	0000921165	This group contains an error.	page 9
50, 000	0	0000050000		
−8, 622, 508	1	0008622508		
1, 010, 101, 010	0	1010101010	This group contains an error.	page 17
−182, 002	1	0000182002		
−60	1	0000000060		
1, 000, 000, 009	1	0000000009	This group contains an error.	page 20
3	0	0000000003		
−9, 825	1	0000009825		

MATHEMATICAL BASES FOR MANAGEMENT DECISION MAKING - Unit I
Matrices and Mathematical Programming.
ALBERT G. HOLZMAN, Dept. of Industrial Engineering, University of Pittsburgh
ROBERT GLASER, Dept. of Psychology, University of Pittsburgh
HALMUTH H. SCHAEFER, Institute of Behavioral Research, University of Maryland.
Published by: ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Ave., Chicago 11, Ill.

Programed text, 4,054 frames, paperback, 8 1/2" x 11 1/2", $18.75. Bound in 3 separate units.
For use in TEMAC BINDER, $1.25; program reusable, $17.50.
Teacher's Manual included.
Table of Contents.
Unit Test(s) included with program.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

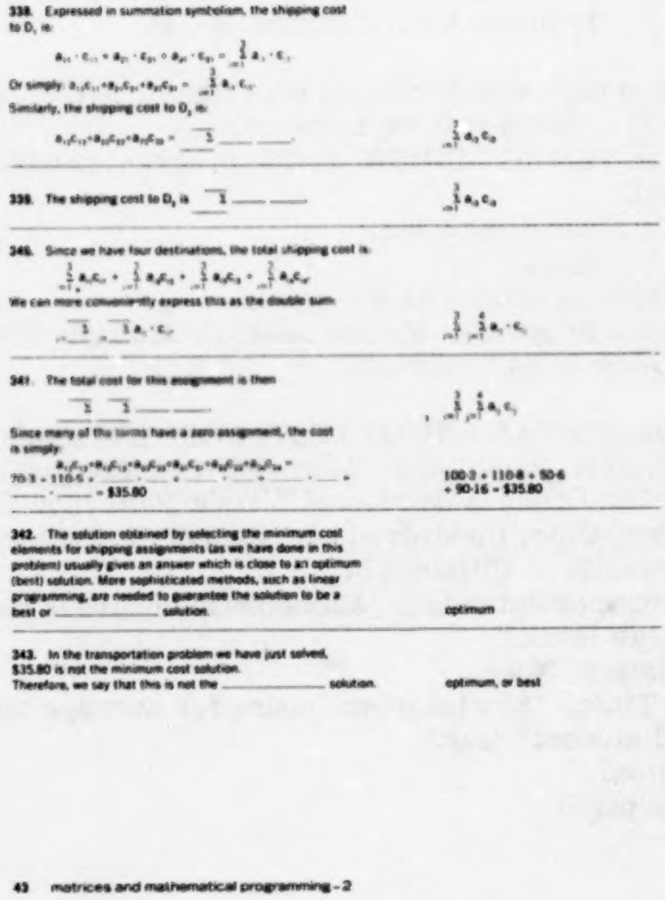
DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Industrial samplings; Westinghouse; Proctor & Gamble; Officers Section of Wright Patterson Center, Dayton, Ohio; Undergraduate students in engineering, University of Pittsburgh."
Other using population(s); "Mathematics courses on the College level."
Prerequisites: None.
Average Time: "35 classroom hours for average college level student" (est.).
No Revision.
(1 sample page)

APPLIED MATHEMATICS

MATHEMATICAL BASES FOR MANAGEMENT DECISION MAKING

Holzman, Glaser, Schaefer; ENCYCLOPAEDIA BRITANNICA PRESS

one sample page:



338. Expressed in summation symbolism, the shipping cost to D_1 is:

$$a_{11}\cdot c_{11} + a_{21}\cdot c_{21} + a_{31}\cdot c_{31} = \sum_{i=1}^{3} a_{i1}\cdot c_{i1}$$

Or simply: $a_{11}c_{11}+a_{21}c_{21}+a_{31}c_{31} = \sum_{i=1}^{3} a_{i1}c_{i1}$

Similarly, the shipping cost to D_2 is:

$a_{12}c_{12}+a_{22}c_{22}+a_{32}c_{32} = \underline{\sum}$ ____ ____.

$\sum_{i=1}^{3} a_{i2}c_{i2}$

---

339. The shipping cost to D_3 is $\underline{\sum}$ ____ ____

$\sum_{i=1}^{3} a_{i3}c_{i3}$

---

340. Since we have four destinations, the total shipping cost is:

$$\sum_{i=1}^{3} a_{i1}c_{i1} + \sum_{i=1}^{3} a_{i2}c_{i2} + \sum_{i=1}^{3} a_{i3}c_{i3} + \sum_{i=1}^{3} a_{i4}c_{i4}$$

We can more conveniently express this as the double sum

$\underline{\sum}\ \underline{\sum}\ a_{ij}\cdot c_{ij}$

$\sum_{i=1}^{3}\sum_{j=1}^{4} a_{ij}\cdot c_{ij}$

---

341. The total cost for this assignment is then

$\underline{\sum}\ \underline{\sum}$ ____ ____

$\sum_{i=1}^{3}\sum_{j=1}^{4} a_{ij}c_{ij}$

Since many of the terms have a zero assignment, the cost is simply:

$a_{11}c_{11}+a_{12}c_{12}+a_{22}c_{22}+a_{23}c_{23}+a_{33}c_{33}+a_{34}c_{34} =$

70·3 + 110·5 + ____ · ___ + ____ · ___ + ____ · ___ +

____ · ____ = $35.80

100·2 + 110·8 + 50·6 + 90·16 = $35.80

---

342. The solution obtained by selecting the minimum cost elements for shipping assignments (as we have done in this problem) usually gives an answer which is close to an optimum (best) solution. More sophisticated methods, such as linear programming, are needed to guarantee the solution to be a best or ______________ solution.

optimum

---

343. In the transportation problem we have just solved, $35.80 is not the minimum cost solution. Therefore, we say that this is not the ______________ solution.

optimum, or best

43 matrices and mathematical programming - 2

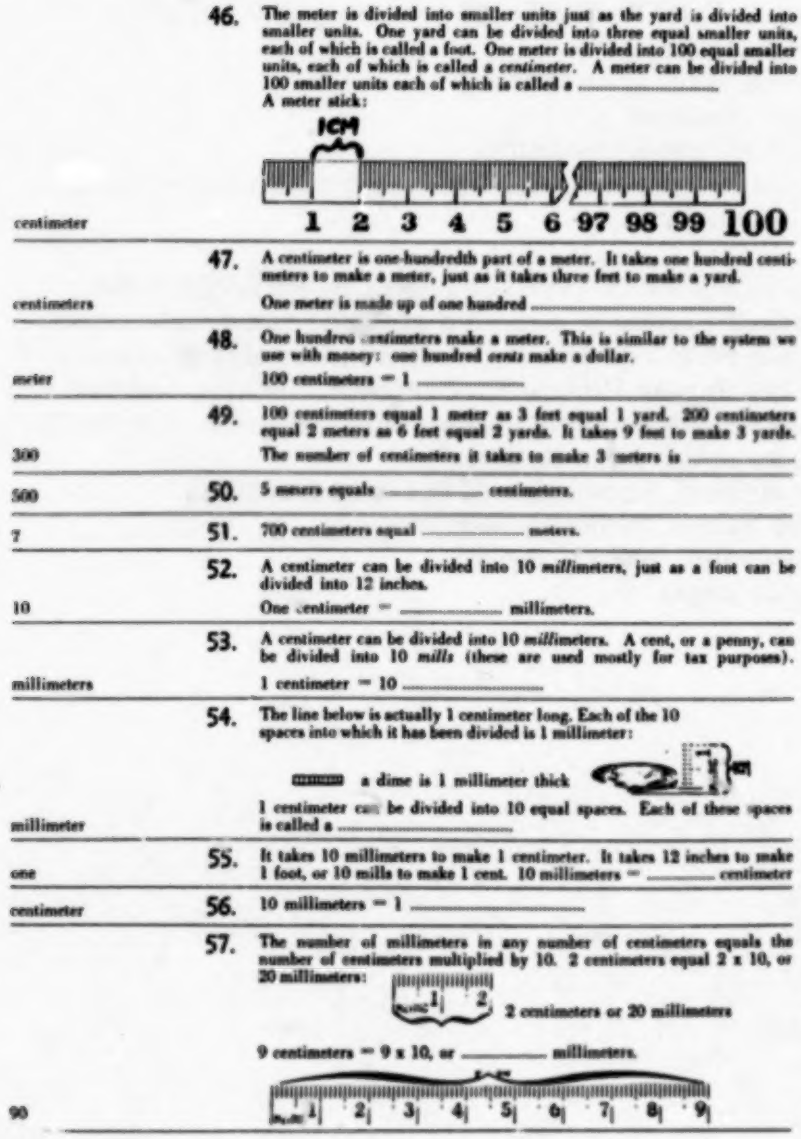
THE MATHEMATICAL LANGUAGE OF SCIENCE
The Measurement of Space, Time and Matter
MARSHALL ARKY, et al., Roto-Vue
Published by MODEL PUBLISHING Company,
1606 Hodiamont Street, St. Louis, Missouri

Programed text, 1069 frames, paperback, 100 pp., 7"x 10 1/2", available in 4 separate units at $2.25 each.
For use in HONOR SYSTEMS machine, $20.00; program reusable, $10.00.
Teacher's Manual included.
Table of Contents.
Diagnostic Test(s) included.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Small groups of selected students for development. Field tested on two high school geometry classes and seven Junior High School science classes, and two large suburban school districts. Subsequent tests in large urban High School."
Prerequisites: Knowledge of decimal fractions.
Average Time: 10 hours (est.).
Next Revision: March, 1963.
(1 sample page)

APPLIED MATHEMATICS

THE MATHEMATICAL LANGUAGE OF SCIENCE
Arky; MODEL PUBLISHING Company
one sample page:


ICM
1
2
3
4
5
6
97
98
99
100
1
2
1
2
3
4
5
6
7
8
9

46. The meter is divided into smaller units just as the yard is divided into smaller units. One yard can be divided into three equal smaller units, each of which is called a foot. One meter is divided into 100 equal smaller units, each of which is called a *centimeter*. A meter can be divided into 100 smaller units each of which is called a ____________
A meter stick:

centimeter

47. A centimeter is one-hundredth part of a meter. It takes one hundred centimeters to make a meter, just as it takes three feet to make a yard.

centimeters — One meter is made up of one hundred ____________

48. One hundred centimeters make a meter. This is similar to the system we use with money: one hundred *cents* make a dollar.

meter — 100 centimeters = 1 ____________

49. 100 centimeters equal 1 meter as 3 feet equal 1 yard. 200 centimeters equal 2 meters as 6 feet equal 2 yards. It takes 9 feet to make 3 yards.

300 — The number of centimeters it takes to make 3 meters is ____________

500 — **50.** 5 meters equals ____________ centimeters.

7 — **51.** 700 centimeters equal ____________ meters.

52. A centimeter can be divided into 10 *milli*meters, just as a foot can be divided into 12 inches.

10 — One centimeter = ____________ millimeters.

53. A centimeter can be divided into 10 *milli*meters. A cent, or a penny, can be divided into 10 *mills* (these are used mostly for tax purposes).

millimeters — 1 centimeter = 10 ____________

54. The line below is actually 1 centimeter long. Each of the 10 spaces into which it has been divided is 1 millimeter:

a dime is 1 millimeter thick

millimeter — 1 centimeter can be divided into 10 equal spaces. Each of these spaces is called a ____________

one — **55.** It takes 10 millimeters to make 1 centimeter. It takes 12 inches to make 1 foot, or 10 mills to make 1 cent. 10 millimeters = ____________ centimeter

centimeter — **56.** 10 millimeters = 1 ____________

57. The number of millimeters in any number of centimeters equals the number of centimeters multiplied by 10. 2 centimeters equal 2 x 10, or 20 millimeters:

2 centimeters or 20 millimeters

9 centimeters = 9 x 10, or ____________ millimeters.

90

APPLIED MATHEMATICS H.S.

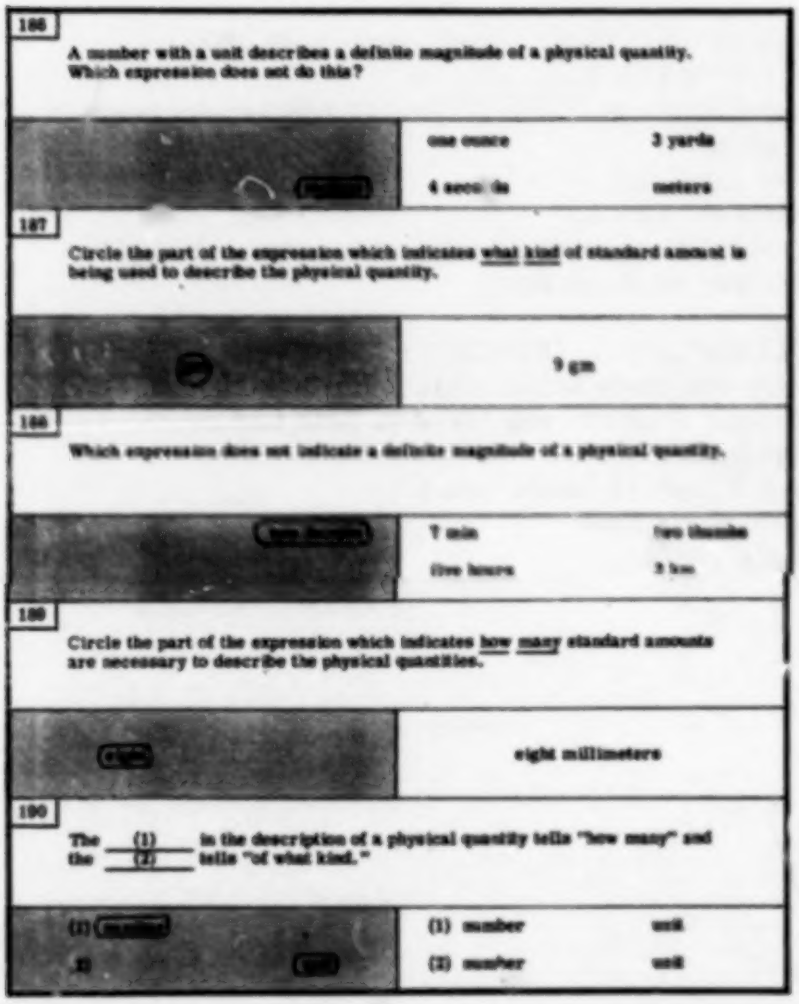
MEASUREMENT IN THE METRIC SYSTEM
NED HATTON, Programer
SHIRLEY B. BITTERLICH, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1500 frames, paperback, 300 pp., 8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "8th-9th grade science students in Albuquerque; Similar students employed in field testing."
Prerequisites:
Average Time: 15 hours (est.).
Next Revision: 1968
(1 sample page)

APPLIED MATHEMATICS

MEASUREMENT IN THE METRIC SYSTEM
Hatton, Bitterlich; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



186

A number with a unit describes a definite magnitude of a physical quantity. Which expression does not do this?

one ounce — 3 yards
4 seconds — meters

187

Circle the part of the expression which indicates what kind of standard amount is being used to describe the physical quantity.

9 gm

188

Which expression does not indicate a definite magnitude of a physical quantity.

7 min — two thumbs
five hours — 3 km

189

Circle the part of the expression which indicates how many standard amounts are necessary to describe the physical quantities.

eight millimeters

190

The ___(1)___ in the description of a physical quantity tells "how many" and the ___(2)___ tells "of what kind."

(1) number — unit
(2) number — unit

APPLIED MATHEMATICS H.S.-Coll.

NUMBERS AND UNITS FOR SCIENCE

FRANK E. HARRIS, Dept. of Chemistry, Stanford University; in conjunction with Behavioral Research Laboratories, Palo Alto, California.

Published by ADDISON-WESLEY Publishing Co., Reading Mass.

Programed text, 1000 frames, paperback, 250 pp. 8 1/2" x 11", $3.75 (approx.).

Teacher's Manual available, $7.00.

Table of Contents.

Unit, Final, Diagnostic Test(s) available. More than one equivalent form of Unit Test available.

Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "High school students with an I.Q. range of 95-145."

Prerequisites: None

Average Time: 15 hours (est.)

Next Revision:

(1 sample page)

APPLIED MATHEMATICS

NUMBERS AND UNITS FOR SCIENCE
Harris; ADDISON-WESLEY
one sample page:

CHEMISTRY SECTION X TEMPERATURE

57.	If we speed up the random motion of the molecules of an object we increase its ____________.	temperature
58.	The temperature of an object doesn't tell us how many molecules the object has. It only tells us how _______ they are going.	fast
59.	If two glasses of water are at the same temperature the average speeds of the molecules in both glasses are _________.	equal
60.	If the molecules of one object cannot change the average speed of the molecules of another object by collisions the two objects are at the same ___________.	temperature
61.	If the molecules of an object are moving very slowly, its temperature is very _____.	low or cold
62.	There is no way of completely stopping the molecules of an object from moving at all. But if we could do this we would have made the lowest possible _______________.	temperature
63.	We call the lowest possible temperature the absolute zero of temperature. The absolute zero is the temperature at which the molecules do not ________ randomly at all.	move
64.	Because molecules are always moving randomly no matter what we do, we cannot cool off an object until it reaches the temperature of absolute _________.	zero

APPLIED MATHEMATICS Jr. H.S.

NUMERATION SYSTEMS AND SCIENTIFIC NOTATION

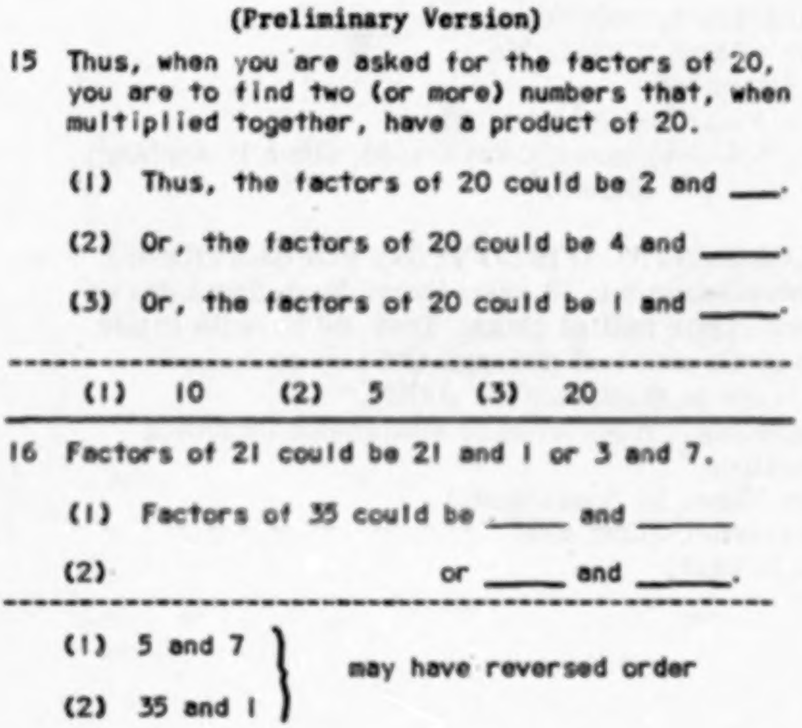
MILDRED REIGH, Mathematics Dept.
J. WILLIAM MOORE, Education Dept.
WENDELL SMITH, Psychology Dept., all of Bucknell University.
Published by McGRAW-HILL BOOK COMPANY, Inc., 330 West 42nd Street, New York City.

Programed text, 1000 frames, $____.
Teacher's Manual available.
Table of Contents.
Unit and Final Test(s) available.
Constructed Responses always used; some Branching; no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental: 12 seventh grade students drawn from upper half of class. Test: 90 seventh grade students, one half average and one-half above average in mathematics ability."
Prerequisites: "Knowledge of arithmetic including fractions."
Average Time: 22 hours (est.).
Next Revision: June, 1963.
(1 sample page)

APPLIED MATHEMATICS

NUMERATION SYSTEMS AND SCIENTIFIC NOTATION
Reigh, Moore, Smith; McGRAW-HILL BOOK COMPANY
one sample page:



(Preliminary Version)

15 Thus, when you are asked for the factors of 20, you are to find two (or more) numbers that, when multiplied together, have a product of 20.

(1) Thus, the factors of 20 could be 2 and ___.

(2) Or, the factors of 20 could be 4 and _____.

(3) Or, the factors of 20 could be 1 and _____.

(1) 10 (2) 5 (3) 20

16 Factors of 21 could be 21 and 1 or 3 and 7.

(1) Factors of 35 could be _____ and ______

(2) or _____ and ______.

(1) 5 and 7
(2) 35 and 1
may have reversed order

APPLIED MATHEMATICS

H.S.-Adult

PRACTICAL MATHEMATICS
GRACE C. MARTIN
ANN SMALLEY, both of U.S.I. Educational Science Division.
Published by DOUBLEDAY & CO., Inc.,
575 Madison Avenue, N.Y.C.

Programed text, 900 frames, Hard cover, 695 pp., 8 1/4" x 5 3/8", $5.95.
Table of Contents, Index.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: High school education
Average Time: 12-16 hours (est.).
Next Revision: Undetermined.
(1 sample plage)

APPLIED MATHEMATICS

PRACTICAL MATHEMATICS
Martin, Smalley; DOUBLEDAY & CO.
one sample page:

Sample from Practical Mathematics

174A

Now that you've learned how to handle signed numbers and exponents, the battle's half won. You're well on your way to a mastery of the fundamentals of algebra. Remember, the better you learn the basic rules, the easier it will be to understand more complicated operations.

We're going to use some of these basic rules now to simplify some rather formidable-looking algebraic expressions.

Any combination of explicit arithmetic numbers and literal numbers by addition, subtraction, multiplication, or division is called an algebraic expression.

$$3x + y - 2$$

$$a^2 - 6b^2 + c$$

$$5r^2$$

$$\frac{6y - 3}{2} \quad \text{and}$$

$$c + 2d - 1$$

are all algebraic expressions.

The parts of the expression joined together by plus or minus signs are called the terms of the expression.

How many terms are there in the algebraic expression $4x^2y^3$?

One.	page 176A
Three.	page 180A

APPLIED MATHEMATICS H.S.

THE SLIDE RULE
ROBERT SAFFOLD
ANN SMALLEY, both of Doubleday & Co.
Published by DOUBLEDAY & COMPANY, Inc.,
575 Madison Avenue, N.Y.C.

Programed text, 456 frames, hard cover, 466 pp.,
8 1/4" x 5 3/8", $4.95.
Table of Contents, Index.
Unit Test(s) included.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: Slide rule.
Average Time: 10-12 hours (est.)
Next Revision: "Not scheduled."
(1 sample page)

APPLIED MATHEMATICS

THE SLIDE RULE
Saffold, Smalley; DOUBLEDAY & CO.
one sample page:

Sample from The Slide Rule

218

(from page 221)

YOUR ANSWER: The antilog of 12.68 is 4.79×10^{12}

Correct. The part of the logarithm to the left of the decimal can be considered the exponent of a power of 10. The part to the right of the decimal is the log of a factor between 1 and 10 by which the power of ten is to be multiplied.

To put this another way, the logarithm 12.68 may be considered the sum of the logarithm 12.00 plus the logarithm 0.68. So the number whose logarithm is 12.68 can be considered the product of the antilogs of 12.00 and 0.68.

The antilog of 12.00, of course, is 10^{12}. The antilog of 0.68 is found by a direct reading. Locate 0.68 on the L scale with the hairline and read the antilog on the D scale; it's 4.79. So the antilog of 12.68 is 4.79×10^{12}; therefore, $64.8^7 = 4.79 \times 10^{12}$.

If instead of raising 64.8 to the seventh power, you want to find the seventh root of 64.8 ($\sqrt[7]{64.8}$), what would you do first?

Divide log 64.8 by 7.	page 222
Divide log 64.8 by log 7.	page 232

MATHEMATICS - GEOMETRY

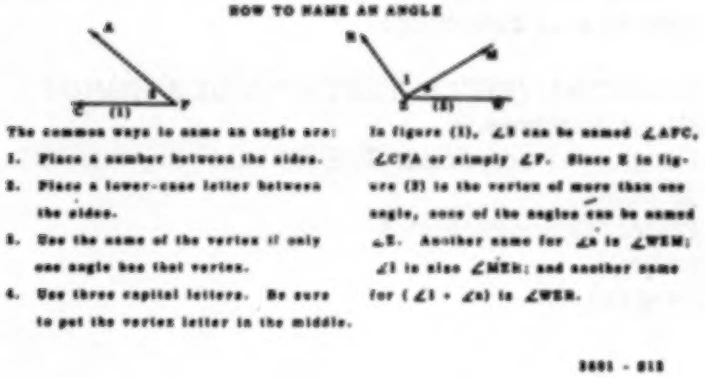
APPLIED GEOMETRY 36
R. CLAYTON COURSEY, Education Engineering, Inc.
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 8640 frames, paperback, 5" x 7", 288 pp., available in 8 separate units at $3.75 each.
For use in SPEED machine, program reusable, $80.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: Arithmetic
Additional material required: SPEED teaching machine, $700 & $850.
Average Time: 20 hours (est.).
Next Revision:
(2 sample pages)

MATHEMATICS-GEOMETRY

APPLIED GEOMETRY 36
Coursey; EDUCATION ENGINEERING
2 sample pages:



HOW TO NAME AN ANGLE

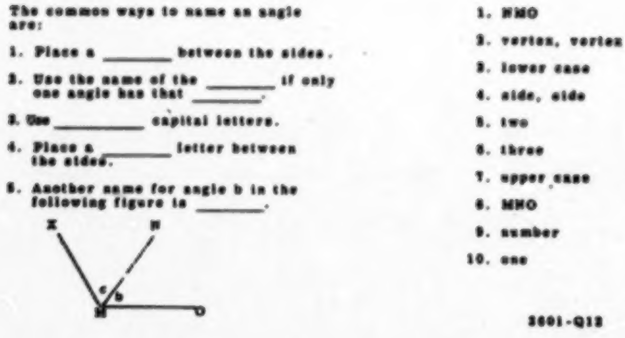
A
2
C
(1)
F
N
1
a
M
E
(2)
W

The common ways to name an angle are:

1. Place a number between the sides.
2. Place a lower-case letter between the sides.
3. Use the name of the vertex if only one angle has that vertex.
4. Use three capital letters. Be sure to get the vertex letter in the middle.

In figure (1), ∠2 can be named ∠AFC, ∠CFA or simply ∠F. Since E in figure (2) is the vertex of more than one angle, none of the angles can be named ∠E. Another name for ∠a is ∠WEM; ∠1 is also ∠MEN; and another name for (∠1 + ∠a) is ∠WEN.

3601 - S12



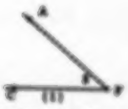
The common ways to name an angle are:

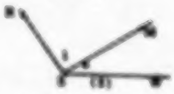
1. Place a ________ between the sides.
2. Use the name of the ________ if only one angle has that ________.
3. Use ________ capital letters.
4. Place a ________ letter between the sides.
5. Another name for angle b in the following figure is ________.

1. NMO
2. vertex, vertex
3. lower case
4. side, side
5. two
6. three
7. upper case
8. MNO
9. number
10. one

3601-Q12

HOW TO NAME AN ANGLE





The common ways to name an angle are:

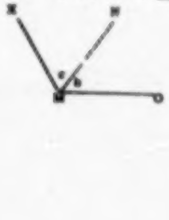
1. Place a number between the sides.
2. Place a lower-case letter between the sides.
3. Use the name of the vertex if only one angle has that vertex.
4. Use three capital letters. Be sure to put the vertex letter in the middle.

In figure (1), ∠3 can be named ∠AFC, ∠CFA or simply ∠F. Since E in figure (2) is the vertex of more than one angle, none of the angles can be named ∠E. Another name for ∠a is ∠WEM; ∠1 is also ∠MEN; and another name for (∠1 + ∠a) is ∠WEN.

3801 - 013

The common ways to name an angle are:

1. Place a ________ between the sides.
2. Use the name of the ________ if only one angle has that ________.
3. Use ________ capital letters.
4. Place a ________ letter between the sides.
5. Another name for angle b in the following figure is ________.



1. NMO
2. vertex, vertex
3. lower case
4. side, side
5. two
6. three
7. upper case
8. MNO
9. number
10. one

3801-Q13

PLANE GEOMETRY

EDWARD B. CURTIS, Teaching Fellow, Harvard University.

Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 North Michigan Avenue, Chicago 11, Illinois

Programed text, 11,207 frames, paperback, 1,151 pp., 8-1/2" x 11-1/2", $19.75. Available in 5 separate units @ $4.50 each.
For use in TEMAC BINDER, $1.25; program reusable, $18.50.
Teacher's Manual available, $3.50.
Table of Contents.
Unit Test(s) available, $1.60.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Selected groups during development; evaluative testing Roanoke City Public Schools, Roanoke, Virginia."
Other using population(s): "Adult education, professional review."
Prerequisites: "Student reading ability of eighth grade level."
Average Time: Average students, 185 classroom hours. (est.).
No Revision.
(1 sample page)

MATHEMATICS-GEOMETRY

PLANE GEOMETRY

Curtis; ENCYCLOPAEDIA BRITANNICA PRESS

one sample page:

4508. We see then that ∠*AOC* and ∠*BOD* are each equal to 180° − ∠*BOC*. We know then that ∠*AOC* and ∠*BOD* are ______.	equal
4509. ∠*AOC* and ∠*BOD* are equal by the use of the axiom, "Quantities equal to the ______ ______ are equal to each other."	same quantity
4510. ∠*AOC* and ∠*BOD* are each ______ to ∠*BOC*.	supplementary
4511. We could show that ∠*AOC* and ∠*BOD* are equal in another way which is very similar to the preceding way. We would use the statement, "Supplements of the same angle are ______."	equal
4512. Since ∠*AOC* and ∠*BOD* are supplements of ∠*COB*, they must be ______.	equal
4513. If ∠*COB* has 133°, then we would also know that ∠*AOD* has ______.	133°
4514. Then ∠*BOD* has (approximately) ______ (no.).	47°
4515. On figure 343, we see three straight lines *AB*, *CD*, and *EF* which all pass through the point ______ (let.).	*P*
4516. On figure 343, the three straight lines pass through the point *P*. We say that the three lines are ______ (wd.); or ______ (same wd.) at the point *P*.	concurrent
4517. On figure 343, ∠*BPE* and ______ are two correct names for ∠3.	∠*EPB*
4518. On figure 343, ∠3 and ______ are a pair of vertical angles.	∠6

446 *Plane Geometry*

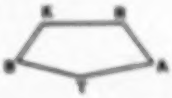
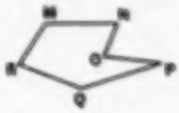
POINTS, LINES, AND PLANES
An Introduction to Geometry in Two Dimensions
VERNON L. DAUSCH, Millburn Junior H. S.
MARTIN M. MOSKOWITZ, Mathematics Department, Vailsburg H. S.
ERNEST R. RANUCCI, Newark State College
MORTON SELTZER, Mathematics Dept., Weequahic H. S.
EDWARD J. ZOLL, Newark State College
Published by THE MACMILLAN COMPANY,
60 Fifth Avenue, New York 11, New York

Programed text, 400 frames, paperback, 112 pp., 8-1/4" x 11", $1.50.
For optional use in FLEXITAB BINDER, $1.67 per copy; program can be reusable.
Teacher's Manual in preparation.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Average 7th and 8th grade students. Some testing of students in Grades 5 and 6."
Prerequisites: "Programs will fit in with both "modern" and traditional backgrounds."
Average Time: 12-15 hours (est.).
Next Revision:
(1 sample page)

MATHEMATICS-GEOMETRY

POINTS, LINES, AND PLANES
Dausch, Moskowitz, Ranucci, Seltzer, Zoll; THE MACMILLAN COMPANY
one sample page:

114. As you have seen, polygons can be classified into two types, concave and convex. A polygon can also be classified according to the number of vertices (or sides, or angles) it has. A polygon with 5 vertices is called a 5-gon.	
A polygon which has 6 sides is called a ______	6-gon
115. A polygon which has 9 angles is called a ______	9-gon
116. A polygon which has 12 vertices is called a ______	12-gon
117. If you saw the name "polygon *BOX*," you would know that the	
polygon had ____ vertices. And then you would know that	3
the polygon is a ____-gon.	3
118. Suppose someone tells you about *polygon RCFG*. You know right	
away that the polygon is a ____-gon.	4
119. Here is *polygon KRATB*. 	
The polygon is a ____-gon. It has ____ vertices, ____ sides,	5, 5, 5
and ____ angles.	5
120. Draw 6-gon *MNOPQR*.	Your drawing might look something like this: 
121. *Polygon MNOPQR* has ____ vertices, ____ sides, and	6, 6
____ angles.	6

[79]

SOLID GEOMETRY

DAVID C. LUCKHAM, Research Assistant, Massachusetts Institute of Technology

Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 2,272 frames, paperback, 8-1/2" x 11-1/2", $15.00. Available in 3 separate units.

For use in TEMAC BINDER, $1.25; program reusable, $13.75.

Teacher's Manual available, $1.75.

Table of Contents.

Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Selected students Palo Alto, Calif. during developmental stages. Roanoke City Public Schools during field test evaluation."

Other using population(s): "Professional review; adult education."

Prerequisities: "Reading level ninth grade."

Average Time: 90 classroom hours for average students (est.).

Will not be revised.

(1 sample page)

MATHEMATICS-GEOMETRY

SOLID GEOMETRY
Luckham; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:

MATHEMATICS-LOGIC H.S. - Coll+

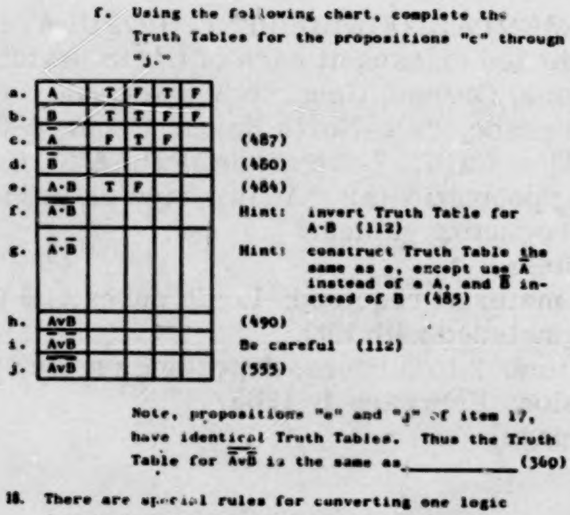
BASIC SYMBOLIC LOGIC
JAMES L. BECKER, RCA
Published by RCA EDUCATIONAL SERVICES,
RADIO CORPORATION OF AMERICA.
Cherry Hill, Camden 8, New Jersey.

Programed text, 200 frames, paperback, 22 pp.,
8 1/2" x 11", $1.25.
"A Review and Test is included in the program."
Constructed Responses usually used; some Multiple
Choice Responses and Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Field Test - 15 Computer Technicians.
Prerequisites: "A knowledge of Binary Arithmetic is
desirable but not essential."
Average Time: 1 1/2-2 hours.
Next Revision:
(1 sample page)

MATHEMATICS-LOGIC

BASIC SYMBOLIC LOGIC
Becker; RCA EDUCATIONAL SERVICES
one sample page:



f. Using the following chart, complete the Truth Tables for the propositions "c" through "j."

a.	A	T	F	T	F	
b.	B	T	T	F	F	
c.	$\bar{A}$	F	T	F		(487)
d.	$\bar{B}$					(460)
e.	$A\cdot B$	T	F			(484)
f.	$\overline{A\cdot B}$					Hint: invert Truth Table for $A\cdot B$ (112)
g.	$\bar{A}\cdot\bar{B}$					Hint: construct Truth Table the same as e, except use $\bar{A}$ instead of a A, and $\bar{B}$ instead of B (485)
h.	$A\vee B$					(490)
i.	$\bar{A}\vee\bar{B}$					Be careful (112)
j.	$\overline{\bar{A}\vee\bar{B}}$					(555)

Note, propositions "e" and "j" of item 17, have identical Truth Tables. Thus the Truth Table for $\overline{\bar{A}\vee\bar{B}}$ is the same as___________(360)

18. There are special rules for converting one logic formula (complex proposition) to another with the same Truth Table. These rules were first discovered by Augustus DeMorgan and in his honor, were termed DeMorgan's Theorem. There are three steps to_____ _________(117) theorem which converts one logic formula to another that has the same_________(372); they are:

WFF
The Beginner's Game of Modern Logic
LAYMAN E. ALLEN, Yale Law School
Published by SCIENCE RESEARCH ASSOCIATES,
259 East Erie Street, Chicago 11, Illinois

Programed text, 71 frames, paperback, 84 pp., 2-1/4" x 4-1/4", $1.00 plus $.25 for mailing and handling from WFF 'N PROOF, Box 71, New Haven, Conn.; will be available from SRA late spring, 1963.
Teacher's Manual included.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Unselected classes at each of the following grades: 6th grade, Orange, Conn.; 6th grade, Hamden, Conn.; 6-10th grade, Yale-North Haven, Conn.; 4-6th grade, Palo Alto, Calif.; 7-9th grade, Palo Alto, Calif."
Other using population(s): "Adults have played and enjoyed these beginning games."
Prerequisites:
Additional material required: Logic cubes and playing mats (included with kit).
Average Time: 2 to 5 hours, depending on the students."
Next Revision: February 1, 1963.
(1 sample page)

MATHEMATICS - LOGIC

WFF
Allen; SCIENCE RESEARCH ASSOCIATES
one sample page:

WFF (sample of program)

In the WFF games, the small letters 'p', 'q', 'r', and 's' are sentence variables. Each of them can symbolize any sentence whatsoever. For example, in one context we might stipulate that 'p' symbolizes the sentence "Logic is fun" and that 'q' symbolizes the sentence "Games are fun." If we did so stipulate, then the WFF 'Kpq' would symbolize the sentence "Logic is fun, and games are fun." What WFF would symbolize the sentence "Games are fun, and logic is fun"?

* * * * * * *

	WFF	Sentence Symbolized	
47	p	Logic is fun.	
	q	Games are fun.	
	Kpq	Logic is fun, and games are fun.	
	?	Games are fun, and logic is fun.	Kqp
48	Apq	Logic is fun, or games are fun.	
	?	Games are fun, or logic is fun.	Aqp
49	Cqp	If games are fun, then logic is fun.	
	?	If logic is fun, then games are fun.	Cpq
50	Np	It is not so that logic is fun.	
	?	It is not so that games are fun.	Nq

* * * * * * *

MATHEMATICS - LOGIC Open

WFF 'N PROOF
The Game of Modern Logic
LAYMAN E. ALLEN, Yale Law School
Published by SCIENCE RESEARCH ASSOCIATES,
259 East Erie Street, Chicago 11, Illinois

Programed text, 2176 frames, paperback, 221 pp., 5" x 8", $6.00 from S.R.A. or plus 25¢ for mailing and handling from WFF 'N PROOF, Box 71, New Haven, Conn.
Teacher's Manual included.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Unselected classes at each of the following: 6th grade, Orange, Conn.; 6th grade, Hamden, Conn.; 6-10th grade, Yale-North Haven, Conn.; 4-6th grade, Palo Alto, Calif.; 7-9th grade, Palo Alto, Calif."
Prerequisites:
Additional material required: Logic cubes, playing mats, timer (all included with the WFF 'N PROOF kit).
Average Time: "Difficult to say. It may take years to become a good player of WFF 'N PROOF, somewhat like bridge or chess."
Next Revision: June, 1963.
(2 sample pages)

MATHEMATICS - LOGIC

WFF 'N PROOF
Allen; SCIENCE RESEARCH ASSOCIATES
2 sample pages:

4 Np? Yes. ($\underline{Np}$ (1) 'p' is a WFF by clause 1 (C1).
(2) Since 'p' is a WFF, 'Np' is a WFF by clause 2 (C2).

In other words:

	WFFs	Reasons
(1)	p	C1
(2)	Np	1, C2)

5 NNq? Yes. ($\underline{N\underline{Nq}}$

	WFFs	Reasons
(1)	q	C1
(2)	Nq	1, C2
(3)	NNq	2, C2

The reason '1, C2' indicates that since 'q' is a WFF in Step 1, 'Nq' is a WFF by C2. The reason '2, C2' indicates that since 'Nq' is a WFF in Step 2, 'NNq' is a WFF by C2.)

* *

The underlined parts in 'Np' and "NNq' of the answers to questions 4 and 5 are WFFs containing two or more letters. The expressions 'Np' and 'Nq' are 2-letter WFFs, and the expression 'NNq' is a 3-letter WFF. Any given expression comprised of two or more letters can be tested to determine whether or not it is a WFF by underlining every part (the whole is also a part) of that expression that is a WFF comprised of two or more letters. When tested by such an underlining procedure, a given two-or-more-letter expression is a WFF if and only if the entire expression gets underlined by one line. For example:

'CpNq' is a WFF.	$\underline{C\ p\ \underline{Nq}}$
'ANrNs is a WFF.	$\underline{A\ \underline{Nr}\ \underline{Ns}}$
'ANrCpNq' is a WFF.	$\underline{A\ \underline{Nr}\ \underline{C\ p\ \underline{Nq}}}$

WFF 'N PROOF (sample of program)

Definition of a WFF

A given expression is a WFF if and only if

(C1) it is a 'p', 'q', 'r', or 's'; or
(C2) it is the expression formed when and 'N' is immediately followed by exactly one WFF; or
(C3) it is the expression formed when a 'C', 'A', 'K', or 'E' is immediately followed by exactly two WFFs.

According to the definition of a WFF, is the expression 'p' a WFF? The answer to this question is "Yes." Hereafter, such questions will be abbreviated. The expression 'p?' appearing in the left column on a page will be an abbreviation for the question "Is the expression 'p' a WFF?" The answer to the question will appear in the right column enclosed in asterisks. Sometimes, immediately following the answer, there will be some further explanation enclosed in parentheses.

QUESTIONS	ANSWERS	
1 p?	Yes.	('p' is a WFF by clause 1 (C1) of the definition of a WFF.)
2 o?	No.	(There is no clause in the definition of a WFF that indicates that an expression that contains an 'o' is a WFF, and a given expression is a WFF only if it is a WFF by one of the clauses of the definition.)
3 pq?	No.	(There is no clause in the definition of a WFF that indicates that an expression comprised of two WFFs is a WFF.)

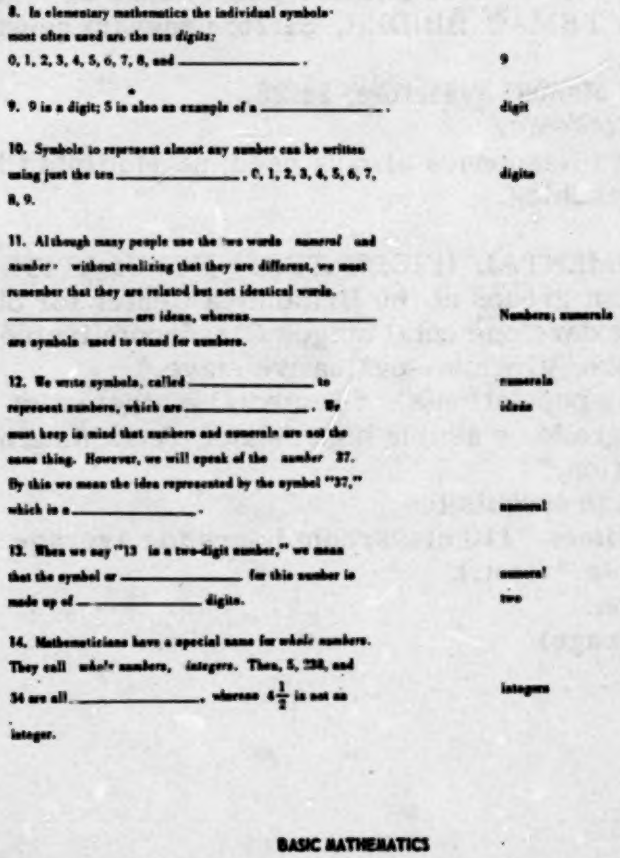
BASIC MATHEMATICS
DANIEL G. BOBROW, Dept. of Mathematics, Massachusetts Institute of Technology
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 3,674 frames, paperback, 590 pp., 8-1/2" x 11-1/2", $10.75. Available in 4 separate units.
For use in TEMAC BINDER, $1.25; program reusable, $9.50.
Teacher's Manual available, $1.25.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Student groups at the Britannica Center for Studies during developmental stage. Classroom tested at Roanoke, Virginia—evaluative stage."
Other using population(s): "Remedial mathematics for ninth grade or senior high school, retraining in adult education."
No special prerequisites.
Average Time: "110 classroom hours for average students." (est.).
No Revision.
(1 sample page)

MATHEMATICS

BASIC MATHEMATICS
Bobrow; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



8. In elementary mathematics the individual symbols most often used are the ten *digits:* 0, 1, 2, 3, 4, 5, 6, 7, 8, and ________ .	9
9. 9 is a digit; 5 is also an example of a ________ .	digit
10. Symbols to represent almost any number can be written using just the ten ________ , 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.	digits
11. Although many people use the two words *numeral* and *number* without realizing that they are different, we must remember that they are related but not identical words. ________ are ideas, whereas ________ are symbols used to stand for numbers.	Numbers; numerals
12. We write symbols, called ________ to represent numbers, which are ________ . We must keep in mind that numbers and numerals are not the same thing. However, we will speak of the *number* 37. By this we mean the idea represented by the symbol "37," which is a ________ .	numerals ideas numeral
13. When we say "13 is a two-digit number," we mean that the symbol or ________ for this number is made up of ________ digits.	numeral two
14. Mathematicians have a special name for *whole numbers.* They call *whole numbers, integers.* Then, 5, 238, and 34 are all ________ , whereas $4\frac{1}{2}$ is not an integer.	integers

BASIC MATHEMATICS

BASIC MATHEMATICS
A Problem-Solving Approach
RICHARD H. O'MALLEY, Math. Dept., Capichino High School. San Bruno, California; in conjunction with Behavioral Research Laboratories, Palo Alto, Calif.
Published by ADDISON-WESLEY PUBLISHING CO., Inc. Reading, Mass.

Programed text, 5000 frames, paperback, 8-1/2" x 11", $10.90 (approx.)
Teacher's Manual available.
Table of Contents.
Diagnostic, Final, Unit Test(s) available. More than one equivalent form of unit test available.
Multiple Choice Constructed Responses usually used; no Branching

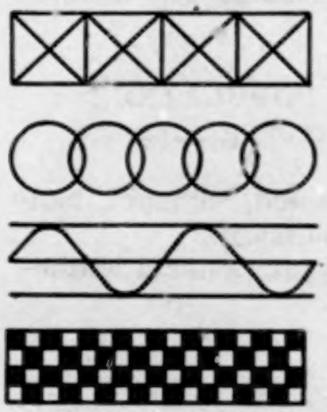
DEVELOPMENTAL (FIELD TEST) POPULATION: "Student tested with both classroom groups and internal control groups."
Prerequisites: "Should know how to add, subtract, multiply and divide simple whole numbers."
Average Time: "Designed for full year General Mathematics course."
Next Revision:
(1 sample page)

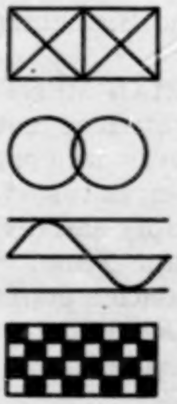
MATHEMATICS

BASIC MATHEMATICS
O'Malley; ADDISON-WESLEY PUBLISHING CO.
one sample page:

SECTION 1

1. **Some people wonder what mathematics is all about. To a great extent, mathematics is a study of patterns. Sometimes these patterns take shapes, like designs on rugs or dishes. Continue the patterns below:**





2. **Numbers, also, often take the form of patterns. What is the next number in the pattern below?**

   1, 2, 3, 4, 5, _____

   6

3. **Scientists are interested in finding patterns. The scientist is interested in finding the pat________ in nature.**

   patterns

FACTORS AND PRIMES
An Introduction to Number Theory

VERNON L. DAUSCH, Millburn Junior High School, New Jersey
MARTIN M. MOSKOWITZ, Vailsburgh High School, Newark, New Jersey
ERNEST R. RANUCCI, Newark State College, Union, New Jersey
MORTON SELTZER, Weequahic High School, Newark, New Jersey
EDWARD J. ZOLL, Newark State College, Union, New Jersey
Published by THE MACMILLAN COMPANY,
60 Fifth Avenue, New York 11, N. Y.

Programed text, 500 frames, paperback, 112 pp., 8-1/4" x 11", $1.50.
Can be used with FLEXITAB BINDER, $1.67 per copy, program can be reusable.
Table of Contents.
Unit and Final Test(s) available.
Constructed Responses usually used; some Multiple Choice; no Branching.

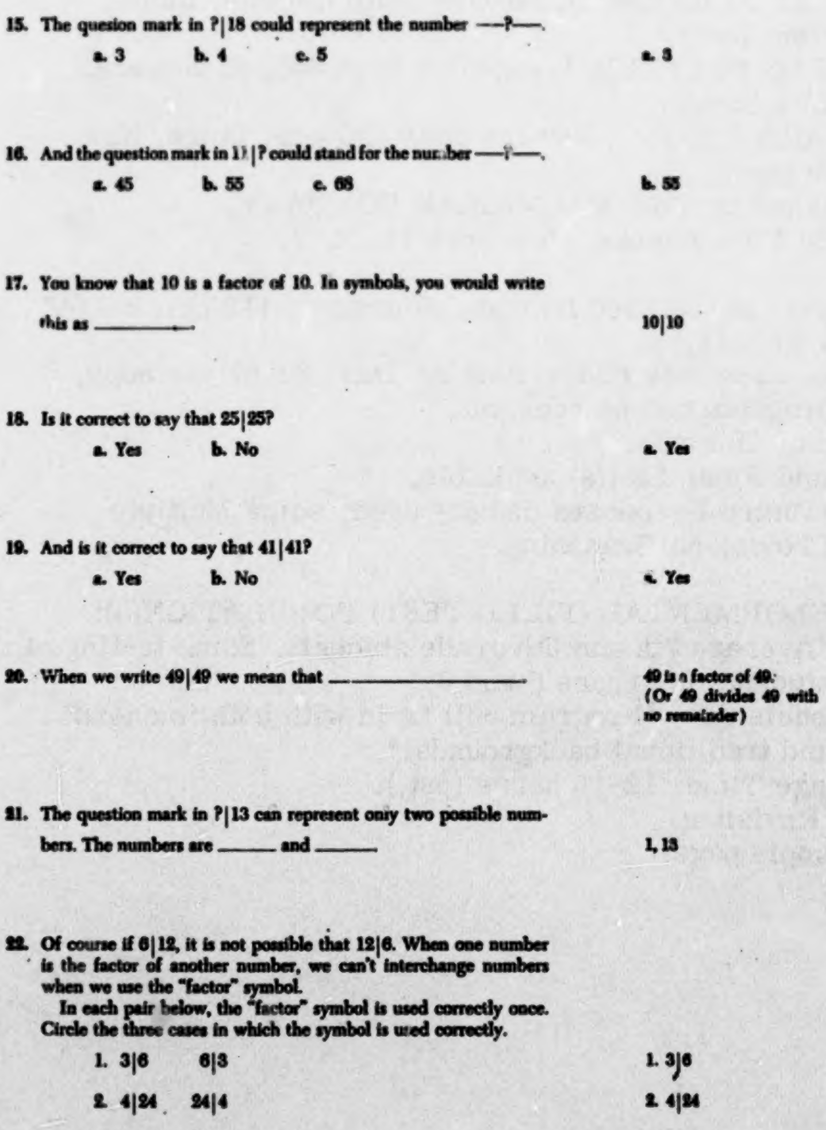
DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Average 7th and 8th grade students. Some testing of students in grades 5 and 6."
Prerequisites: "Program will fit in with both 'modern' and traditional backgrounds."
Average Time: 12-15 hours (est.).
Next Revision:
(1 sample page)

MATHEMATICS

FACTORS AND PRIMES

Dausch, Moskowitz, Ranucci, Seltzer, Zoll; THE MACMILLAN COMPANY

one sample page:



15. The question mark in ?|18 could represent the number ——?——. a. 3 b. 4 c. 5	a. 3
16. And the question mark in 11|? could stand for the number ——?——. a. 45 b. 55 c. 68	b. 55
17. You know that 10 is a factor of 10. In symbols, you would write this as ________.	10|10
18. Is it correct to say that 25|25? a. Yes b. No	a. Yes
19. And is it correct to say that 41|41? a. Yes b. No	a. Yes
20. When we write 49|49 we mean that ______________.	49 is a factor of 49. (Or 49 divides 49 with no remainder)
21. The question mark in ?|13 can represent only two possible numbers. The numbers are ______ and ______.	1, 13
22. Of course if 6|12, it is not possible that 12|6. When one number is the factor of another number, we can't interchange numbers when we use the "factor" symbol. In each pair below, the "factor" symbol is used correctly once. Circle the three cases in which the symbol is used correctly. 1. 3|6 6|3 2. 4|24 24|4 3. 5|50 50|5	1. 3|6 2. 4|24 3. 5|50

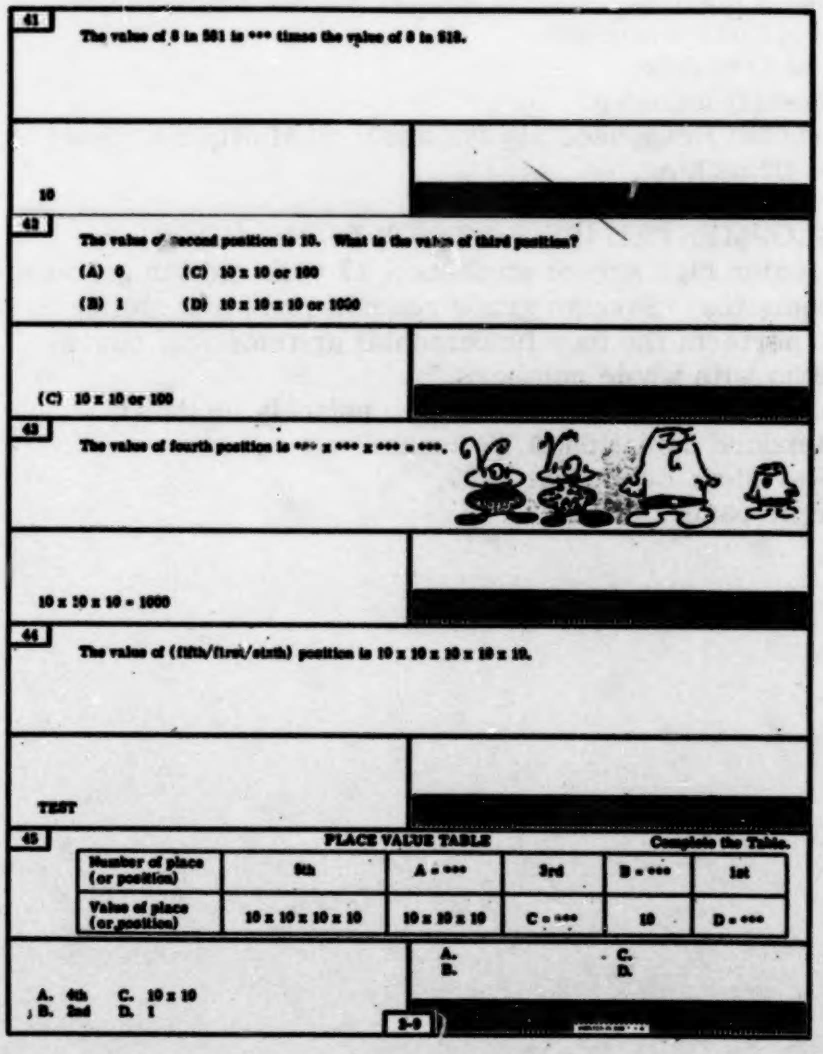
INTERMEDIATE MATHEMATICS SERIES:
INTRODUCTION TO MODERN MATHEMATICS
CHARLOTTE YESSELMAN
PAUL THOMAS, both of Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 1,042 frames, paperback, 255 pp., 8 1/2" x 11", $8.50.
For use in MIN/MAX II machine, $25.00; program reusable, $7.50.
Teacher's Manual: General Manual for all TMI-Grolier programs available.
Table of Contents.
Unit Test(s) included.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Junior high school students - 12 year old 7th graders."
Prerequisites: "Seventh grade reading level and ability to perform the four fundamental arithmetical operations with whole numbers."
Average Time: 15-25 hours (based entirely on data); standard deviation, 1.49 hours.
Next Revision: February, 1963.
(1 sample page)

MATHEMATICS

INTERMEDIATE MATHEMATICS SERIES: INTRODUCTION TO MODERN MATHEMATICS
Yesselman, Thomas; TEACHING MATERIALS CORPORATION
one sample page:



41 The value of 8 in 581 is *** times the value of 8 in 518.

10

42 The value of second position is 10. What is the value of third position?

(A) 0 (C) 10 x 10 or 100

(B) 1 (D) 10 x 10 x 10 or 1000

(C) 10 x 10 or 100

43 The value of fourth position is *** x *** x *** = ***.

10 x 10 x 10 = 1000

44 The value of (fifth/first/sixth) position is 10 x 10 x 10 x 10 x 10.

TEST

45 PLACE VALUE TABLE Complete the Table.

Number of place (or position)	5th	A = ***	3rd	B = ***	1st
Value of place (or position)	10 x 10 x 10 x 10	10 x 10 x 10	C = ***	10	D = ***

A.
B.
C.
D.

A. 4th C. 10 x 10
B. 2nd D. 1

3-9

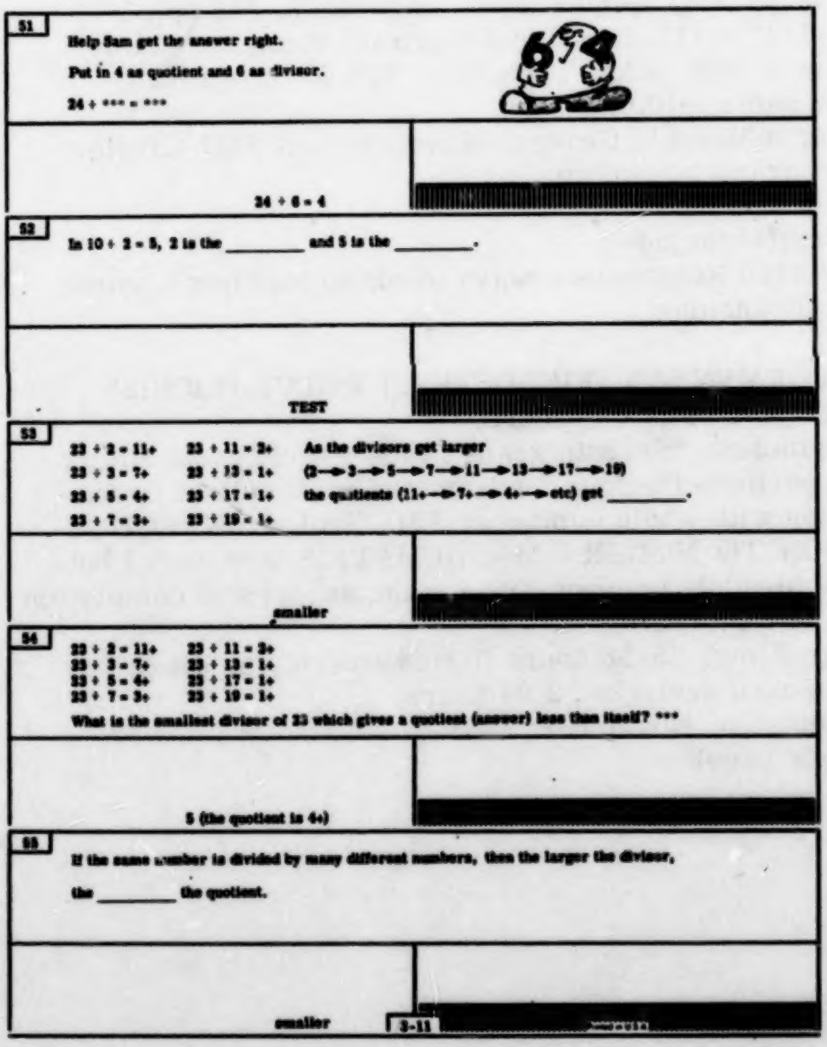
INTERMEDIATE MATHEMATICS SERIES--MODERN MATHEMATICS: NUMBER SYSTEMS
CHARLOTTE YESSELMAN
PAUL THOMAS, both of Teaching Materials Corporation
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York

Programed text, 1,480 frames, paperback, 346 pp., 8-1/2" x 11", bound in 2 separate volumes, $11.00.
For use in MIN/MAX II machine, $25.00; program reusable, $10.00.
Teacher's Manual: General Manual for all TMI-Grolier programs available.
Table of Contents.
Unit Test(s) included.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "12 year old 7th graders."
Prerequisites: "Seventh grade reading ability and ability to perform the four fundamental arithmetical operations with whole numbers. TMI-Grolier INTRODUCTION TO MODERN MATHEMATICS is a useful but not absolute prerequisite for the successful completion of this course."
Average Time: 25-35 hours (based entirely on data); standard deviation, 2.04 hours.
Next Revision: November, 1963.
(1 sample page)

MATHEMATICS

INTERMEDIATE MATHEMATICS SERIES—MODERN MATHEMATICS: NUMBER SYSTEMS
Yesselman, Thomas; TEACHING MATERIALS CORPORATION
one sample page:



51

Help Sam get the answer right.

Put in 4 as quotient and 6 as divisor.

24 ÷ *** = ***

24 ÷ 6 = 4

52

In 10 ÷ 2 = 5, 2 is the ________ and 5 is the ________.

TEST

53

23 ÷ 2 = 11+ 23 ÷ 11 = 2+ As the divisors get larger
23 ÷ 3 = 7+ 23 ÷ 13 = 1+ (2—→3—→5—→7—→11—→13—→17—→19)
23 ÷ 5 = 4+ 23 ÷ 17 = 1+ the quotients (11+—→7+—→4+—→etc) get ________.
23 ÷ 7 = 3+ 23 ÷ 19 = 1+

smaller

54

23 ÷ 2 = 11+ 23 ÷ 11 = 2+
23 ÷ 3 = 7+ 23 ÷ 13 = 1+
23 ÷ 5 = 4+ 23 ÷ 17 = 1+
23 ÷ 7 = 3+ 23 ÷ 19 = 1+

What is the smallest divisor of 23 which gives a quotient (answer) less than itself? ***

5 (the quotient is 4+)

55

If the same number is divided by many different numbers, then the larger the divisor, the ________ the quotient.

smaller

3-11

INTRODUCTION TO BASIC PRINCIPLES OF MODERN MATHEMATICS
HAINES, Harper and Row
AMARYLLIS D. HUNT, Programer, General Programmed Teaching Corporation
JOHN MORRIS, Editor, General Programmed Teaching Corporation
Published by HARPER AND ROW,
49 E. 33rd St., New York, N.Y.

Programed text, 1500 frames, paperback, 300 pp., $2.00.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

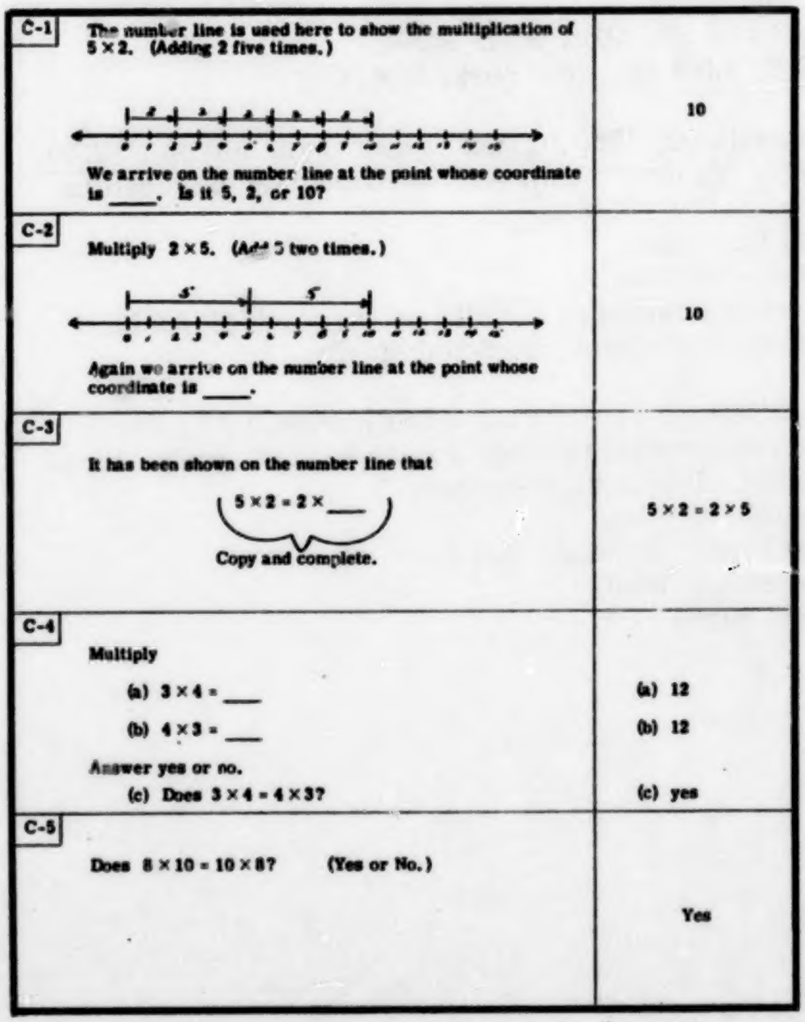
DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: Junior high students. Field testing: Junior high students."
Prerequisites: None
Average Time: 20 hours (est.).
Next Revision: 1968.
(1 sample page)

MATHEMATICS

INTRODUCTION TO BASIC PRINCIPLES OF MODERN MATHEMATICS

Haines, Hunt, Morris; HARPER AND ROW

one sample page:



C-1	The number line is used here to show the multiplication of 5 × 2. (Adding 2 five times.) We arrive on the number line at the point whose coordinate is ____. Is it 5, 2, or 10?	10
C-2	Multiply 2 × 5. (Add 5 two times.) Again we arrive on the number line at the point whose coordinate is ____.	10
C-3	It has been shown on the number line that $\underbrace{5 \times 2 = 2 \times \_\_\_}_{\text{Copy and complete.}}$	5 × 2 = 2 × 5
C-4	Multiply (a) 3 × 4 = ___ (b) 4 × 3 = ___ Answer yes or no. (c) Does 3 × 4 = 4 × 3?	(a) 12 (b) 12 (c) yes
C-5	Does 8 × 10 = 10 × 8? (Yes or No.)	Yes

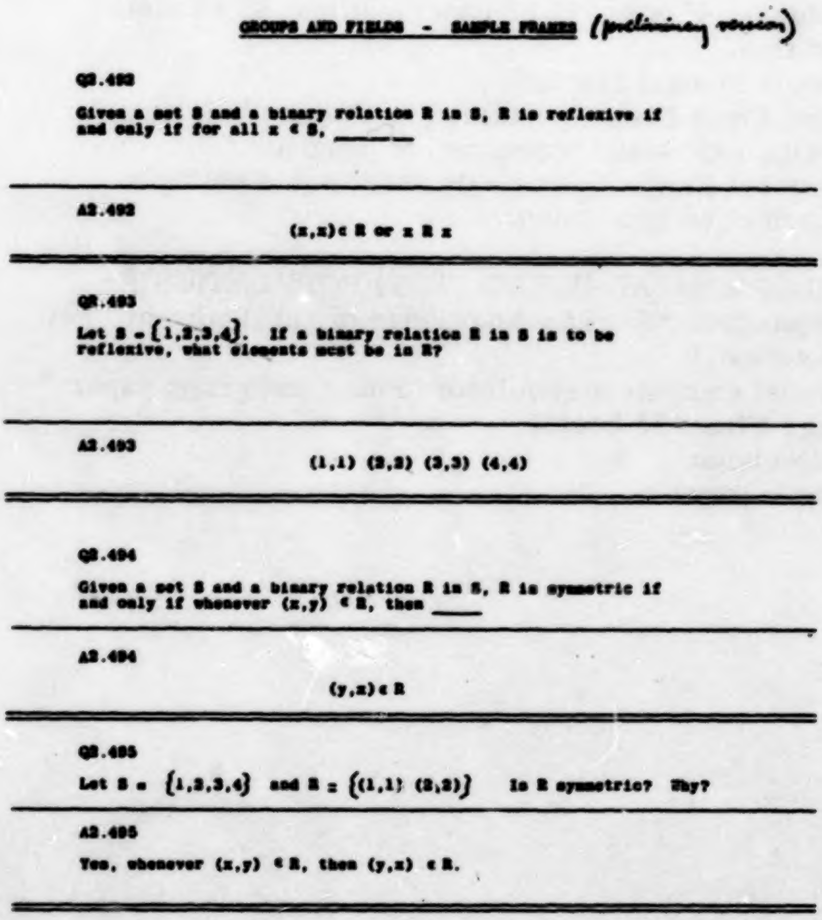
AN INTRODUCTION TO GROUPS AND FIELDS
A Programmed Unit in Modern Mathematics
BOYD EARL, Teacher of mathematics, high-school and Bucknell University
WENDELL SMITH, Psychology Dept., Bucknell University
WILLIAM MOORE, Education Dept., Bucknell University.
Published by McGRAW-HILL BOOK COMPANY, Inc., 330 West 42nd Street, New York City.

Programed text, 1500 frames, paperback and hardcover, 400 pp., 6" x 9", $3.95 paper edition; $5.95 cloth edition.
Teacher's Manual available.
Unit and Final Tests "contained in Teacher's Manual"
Diagnostic tests "contained in program."
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: "Working knowledge of set theory and set notation."
Additional equipment required: "Ruler and graph paper."
Average Time: 25 hours.
Next Revision:
(1 sample page)

MATHEMATICS

AN INTRODUCTION TO GROUPS AND FIELDS
Earl, Smith, Moore; McGRAW-HILL BOOK COMPANY
one sample page:



GROUPS AND FIELDS - SAMPLE FRAMES (preliminary version)

Q2.492

Given a set S and a binary relation R in S, R is reflexive if and only if for all $x \in S$, ______

A2.492

$(x,x) \in R$ or $x R x$

Q2.493

Let $S = \{1,2,3,4\}$. If a binary relation R in S is to be reflexive, what elements must be in R?

A2.493

(1,1) (2,2) (3,3) (4,4)

Q2.494

Given a set S and a binary relation R in S, R is symmetric if and only if whenever $(x,y) \in R$, then ____

A2.494

$(y,x) \in R$

Q2.495

Let $S = \{1,2,3,4\}$ and $R = \{(1,1)\ (2,2)\}$ Is R symmetric? Why?

A2.495

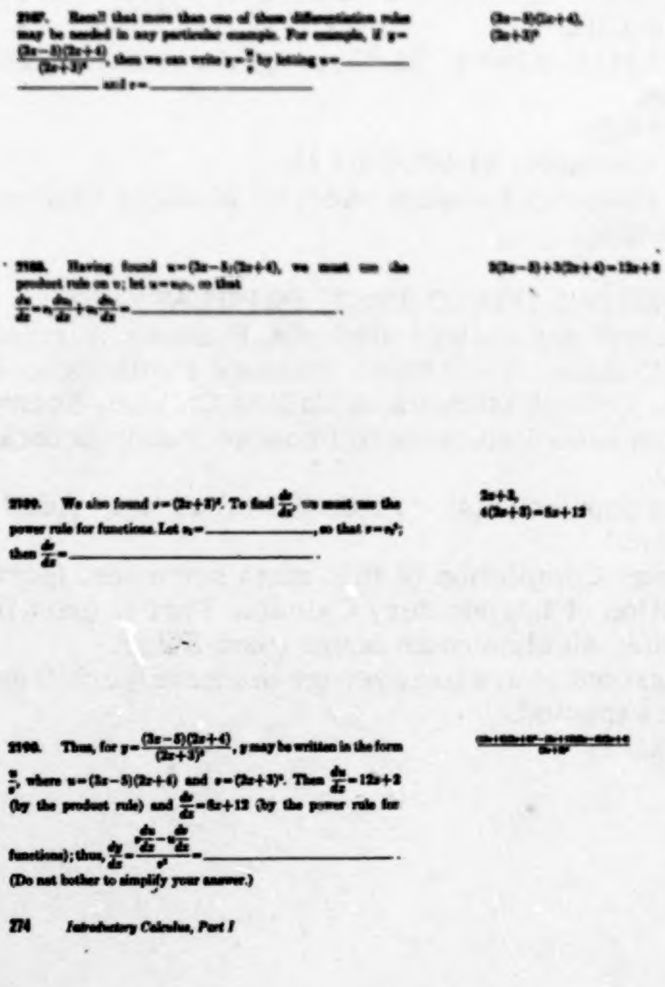
Yes, whenever $(x,y) \in R$, then $(y,x) \in R$.

INTRODUCTORY CALCULUS
Part I and Part II
DANIEL G. BABROW, Mathematics Dept.,
Massachusetts Institute of Technology
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 North Michigan Avenue, Chicago 11, Ill.
Programed texts, 2,194 frames (part I), 1,154 frames (part II), paperback, 8 1/2" x 11 1/2", $7.35 (part I), $7.50 (part II).
For use in TEMAC Binder, $1.25; program reusable, $6.10 each part.
Table of Contents.
Unit Test(s) available, $1.60 (Part I).
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"High school and college students, Roanoke, Virginia, Hollins College. Field test - Roanoke Public Schools. (part I). College students at Hollins College, Roanoke, Va., High school students in Roanoke Public Schools." (part II).
Others using population(s): "Professional review; Adult education."
Prerequisites: Completion of H.S. math sequence. (part I)
Completion of Introductory Calculus Part I. (part II)
Average Time: 40 classroom hours (part I) est.
25 classroom hours for average students (part II) est.
No Revision expected.
(2 sample pages)

MATHEMATICS

INTRODUCTORY CALCULUS
Babrow; ENCYCLOPAEDIA BRITANNICA PRESS
2 sample pages:



2187. Recall that more than one of these differentiation rules may be needed in any particular example. For example, if $y=\frac{(3x-5)(2x+4)}{(2x+3)^2}$, then we can write $y=\frac{u}{v}$ by letting $u=$ ____________ and $v=$ ____________	$(3x-5)(2x+4)$, $(2x+3)^2$
2188. Having found $u=(3x-5)(2x+4)$, we must use the product rule on u; let $u=u_1u_2$, so that $\frac{du}{dx}=u_1\frac{du_2}{dx}+u_2\frac{du_1}{dx}=$ ____________.	$2(3x-5)+3(2x+4)=12x+2$
2189. We also found $v=(2x+3)^2$. To find $\frac{dv}{dx}$, we must use the power rule for functions. Let $v_1=$ ____________, so that $v=v_1^2$; then $\frac{dv}{dx}=$ ____________.	$2x+3$, $4(2x+3)=8x+12$
2190. Thus, for $y=\frac{(3x-5)(2x+4)}{(2x+3)^2}$, y may be written in the form $\frac{u}{v}$, where $u=(3x-5)(2x+4)$ and $v=(2x+3)^2$. Then $\frac{du}{dx}=12x+2$ (by the product rule) and $\frac{dv}{dx}=8x+12$ (by the power rule for functions); thus, $\frac{dy}{dx}=\frac{v\frac{du}{dx}-u\frac{dv}{dx}}{v^2}=$ ____________. (Do not bother to simplify your answer.)	[illegible]

1. In the course Introductory Calculus I, we defined the derivative f' of a function f and developed certain rules for differentiating various types of functions. Before taking up our first "new" topic (extreme values of functions), we will review some of these rules and, at the same time, introduce a few new terms and theorems.

2. The equation $y=\sqrt{1-x^2}$ defines y as an *explicit* function of x; the equation $x^2+y^2=1$ defines y as a(n) __________ function of x.

implicit

3. Given an equation which defines y as an implicit function of x, we can differentiate *both sides of the equation* (using the chain rule to differentiate expressions in y) and then solve for $\frac{dy}{dx}$. For example, given $3xy=1$, we may write $3\frac{d}{dx}(xy)=\frac{d}{dx}(1)$; thus, ____________ $=0$.

$3\left(y+x\frac{dy}{dx}\right)$

4. From $3xy=1$ we get, by differentiating both sides of the equation, $3y+3x\frac{dy}{dx}=0$; solving, $\frac{dy}{dx}=$ ________ .

$-\frac{y}{x}$

5. Given $x^2y^2-2xy=10$, find $\frac{dy}{dx}$.

$2xy^2+2x^2y\frac{dy}{dx}-2y-2x\frac{dy}{dx}=0$,

so $\frac{dy}{dx}=\frac{y-xy^2}{x^2y-x}$.

6. Suppose $y=f(x)$; if we are given $y=g(t)$ and $x=f(t)$, these equations are called __________ equations for $y=f(x)$. Here, t is the parameter.

parametric

7. Given $y=g(t)$ and $x=f(t)$, we proved that $\frac{dy}{dx}=$ __________ .

$\dfrac{\frac{dy}{dt}}{\frac{dx}{dt}}\left(\text{or } \frac{g'(t)}{f'(t)}\right)$

MATHEMATICS Jr. H.S.-H.S.

MATHEMATICS IN ACTION
Understanding Number Systems
PAUL H. BUCKLEY, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.); program reusable, 200 frames, $2.00-$2.50. (Machine may be marketed in retail channels at this $20 combination price including 3 or 4 programs.)
Constructed Responses sometimes used; some Branching; no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Private and public schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

MATHEMATICS

MATHEMATICS IN ACTION
Buckley; HONOR PRODUCTS COMPANY
one sample page:

The letter Q may be symbolized by either the number 17, or by the number 46. The number 17, therefore, is congruent to the number ________.	46
In the language of mathematicians, Independence Day is the same as, or is __________ to, the Fourth of July.	congruent
In geometry, if two figures are the same in shape and size, they are said to be __________ to each other.	congruent
If we agree on all these issues, your views and my views (are/are not) _______ congruent.	are
The mathematical shorthand for congruent is the symbol $\equiv$. If 9 and 38 are congruent, you could express this as 9 ________ 38.	$\equiv$
If the numbers 8 and 37 symbolize the same letter, which of the following is correct? a. $8 = 37$ b. $8 \equiv 37$ Press and hold the button of your choice. The roll will move only when you choose the correct answer.	b. $8 \equiv 37$

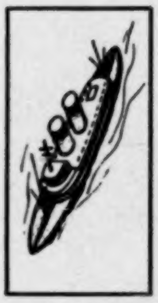
MATHEMATICS ENRICHMENT
Programs A, B and C (3 volumes)
Sets, Numeration, Geometry
GEORGE SPOONER, Central Connecticut State College
Published by HARCOURT, BRACE & WORLD,
750 Third Avenue, New York 17, New York

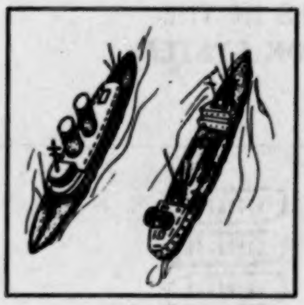
Programed texts; Program A, 1107 frames;
Program B, 1228 frames; Program C, 1035 frames;
hardcover; Program A, 192 pp.; Program B, 224 pp.;
Program C, 208 pp.; 6 3/4" x 9 1/8"; Program A,
B and C, $2.96 each.
Answer sheets available, $.40.
Teacher's Manual available, free.
Table of Contents.
Unit Test(s) available, free.
Constructed Responses always used; no Multiple Choice
Responses; no Branching.

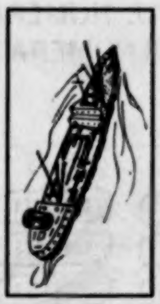
DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"200 students (grades 4-5-6, students working at or
above grade placement)."
Prerequisites: Students should be in grades 4, 5 or 6;
working at or above grade placement.
Additional material required: "Skil-Slide," list price
$.60, net to schools $.40.
Average Time: 12-18 hours (est.).
Next Revision: "Not scheduled yet."
(2 sample pages)

MATHEMATICS

MATHEMATICS ENRICHMENT
Spooner; HARCOURT, BRACE & WORLD
2 sample pages:


Set D


Set E


Set F

Set E is the union of Set ______ and Set ______. 143

F, D *or* D, F

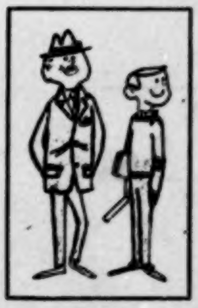
Set E is the union of Set D and Set F. Set E must have all the ______ of Set D and all the members of Set F. 144

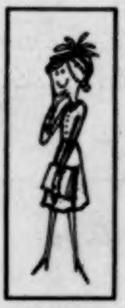
members

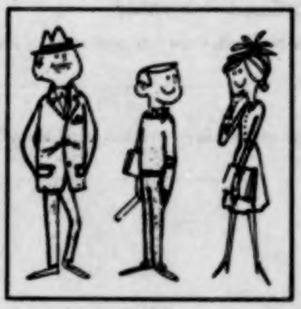
The union of Set F and Set ______ is Set ______. 145

D, E
(*in this order*)

Here three sets are pictured.


Set M

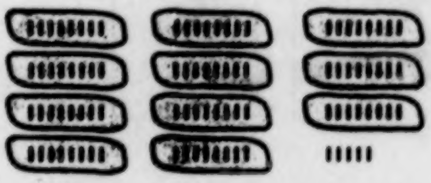

Set W


Set C

Set C is the u_ _ _ _ of Set M and Set W. 146

union

THREE-PLACE NUMERALS IN THE BASE-EIGHT NUMERATION SYSTEM



Here we see ones marks collected in sets of (how many?) ________. 272

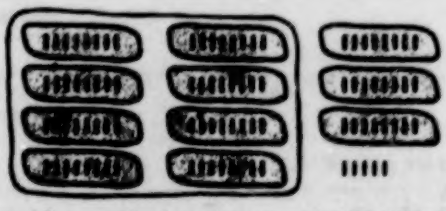
---

eight

When we think of things collected in sets of eight, we are thinking in the ________-________ numeration system. 273

---

base-eight



Here, one large curve has been drawn around eight of the ________ of eight ones. 274

---

sets

The set inside the large closed curve contains (how many?) ________ sets of eight ones. 275

---

eight

MODERN MATHEMATICS: A PROGRAMED TEXTBOOK, COURSE I.

LEWIS D. EIGEN, Vice President,
JEROME D. KAPLAN, Programer
RUTH EMERSON, Programer,
HAROLD M. KROUSE, Programer, all of The Center For Programed Instruction, Inc.
Published by SCIENCE RESEARCH ASSOCIATES, Inc., 259 East Erie Street, Chicago 11, Illinois.

Programed text, 8419 frames, paperback, 838 pp., 8 1/2" x 11", $10.00. Bound in 10 separate units at $1.25 each.
Answer sheets available, $1.00 (1 set free with each set of texts).
Teacher's Manual available, $1.25.
Table of Contents and Index.
Unit Tests available, $2.50; Final Test available, $.30.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "8th grade independent school classes; 8th grade public school enrichment classes; 9th grade public school academic classes."
Other using population(s): "6th grade enrichment classes, 10th-12th grade classes, college classes, 10th grade remedial classes, in-service teachers acquiring background in modern mathematics."
Prerequisites: "Competence in arithmetic; 7th grade reading level."
Average Time: 80-100 hours (est.).
Next Revision: 1965.
(9 sample pages)

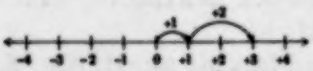
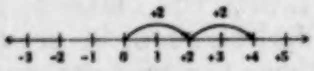
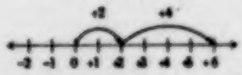
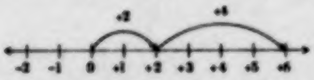
MATHEMATICS

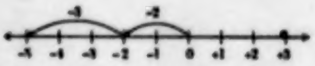
MODERN MATHEMATICS: A PROGRAMED TEXTBOOK, COURSE I.
Eigen, Kaplan, Emerson, Krouse; SCIENCE RESEARCH ASSOCIATES
9 sample pages:

Selections from
MODERN MATHEMATICS: A PROGRAMED TEXTBOOK

Reprinted from MODERN MATHEMATICS by Lewis D. Eigen, Jerome D. Kaplan, and Ruth Emerson. © 1961, Science Research Associates, Inc.

Chapter 2. DIRECTED NUMBERS

+3	165.	 When we add trips (directed numbers), we always start at '0'. (+1) + (+2) = ☐.
0	166.	When we add trips (directed numbers), we always start at '☐'.
+7 *or* (+7) *(+7 is better.)*	167.	(+6) + (+1) = ☐. *(Hint: Draw a scale and work out the two trips if you have to.)*
+9 +11 +12	168.	(+4) + (+5) = ☐. (+2) + (+9) = ☐. (+8) + (+4) = ☐.
If your answer was three, go directly to frame 176. If your answer was not three, go to the next frame.	169.	The last frame had three problems on it. How many did you get right? ☐
+4	170.	 (+2) + (+2) = ☐.
	171.	To find out what (+2) + (+4) is, first draw a number scale. Then, starting at '0', draw an arrow representing a trip of +2. Then from '+2' draw an arrow representing a trip of +4. Draw a number scale and indicate the addition: ☐.
+6	172.	 (+2) + (+4) = ? The second arrow ends up at '☐'.
+6	173.	(+2) + (+4) = ☐

+11	174.	(+8) + (+3) = ☐. *(Hint: To get this answer you may have to draw a scale with more mileposts than previously.)*
+12	175.	(+4) + (+8) = ☐.
Yes.	176.	If we start at '0' and take two trips to the right, do we end up to the right of '0'? ☐ *(Yes or no?)*
Yes. *(The sum of two positive numbers is a positive number.)*	177.	If we add two positive numbers, is the sum a positive number? ☐ *(Yes or no?)*
-5	178.	 (-2) + (-3) = ☐. *(Hint: Where do we end up after the two trips?)*

Chapter 5. SETS AND SUBSETS

6	1.	The numerals we use to denote numbers are: '0', '1', '2', '3', '4', '5', '☐', '7', '8', '9'.
10	2.	This set of symbols, '0', '1', '2', '3', '4', '5', '6', '7', '8', '9', is made up of ☐ *(how many?)* different symbols.
9	3.	The set of whole numbers from 0 to 9 is made up of 10 numbers. They are 0, 1, 2, 3, 4, 5, 6, 7, 8, ☐.
10	4.	The numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 form a set of ☐ *(how many?)* numbers.
set	5.	The numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 form a ☐ of 10 numbers
c	6.	The letters *a*, *b*, ☐ form a set of the first three letters of the alphabet.
set	7.	The letters *a*, *b*, *c* form a ☐ of the first three letters of the alphabet.
y	8.	The letters *x*, ☐, *z* form a set of the last three letters of the alphabet.
set	9.	The letters *x*, *y*, *z* form a ☐ of the last three letters of the alphabet.
three	10.	The set formed by *x*, *y*, *z* is the set of the last ☐ letters of the alphabet.
y	11.	By using the symbols '{ }' to enclose *x*, *y*, *z* we can represent the set of the last three letters of the alphabet by '{*x*, ☐, *z*}'.
last	12.	By using the symbols '{ }' we can represent the set of the ☐ three letters of the alphabet by '{*x*, *y*, *z*}'.
set	13.	We can represent the ☐ of the last three letters of the alphabet by '{*x*, *y*, *z*}'.

b	14.	We can represent the set of the first two letters of the alphabet by '{a, ☐}'.
{ }	15.	One way to represent a set is to use the symbols '{ }'. We call these symbols 'set braces'. They are **not** parentheses. Write the symbols we call set braces in the *answer space*. ☐
{a, b} *(Have you used the symbols '{ }' and the comma?)*	16.	When we represent the set of the first two letters of the alphabet, we use the set braces, '{ }', and we use the comma: '{a, b}'. Write the symbols for this set in the answer space. ☐
{a, b}	17.	By using the set braces, '{ }', and the comma, we may represent the set of the first two letters of the alphabet by writing '☐'.
y	18.	We can represent the set of the last two letters of the alphabet by '{☐, z}'.
{y, z} *(Have you used the comma?)*	19.	We can represent the set of the last two letters of the alphabet by '☐'.
b	20.	We can represent the set of the first three letters of the alphabet by '{a, ☐, c}'.
{a, *b*, *c*, *d*} *(Have you used commas?)*	21.	We can represent the set of the first four letters of the alphabet by '☐'.
three	22.	{a, b, c} is the set of the first ☐ letters of the alphabet.
set	23.	{w, x, y, z} is the ☐ of the last four letters of the alphabet.

Chapter 7. ORDERED PAIRS AND RELATIONS

pairs	86.	We call any set of ordered pairs 'a **relation**'. {(0, 1), (2, 1), (3, 2)} is a set of ordered ☐. Therefore, {(0, 1), (2, 1), (3, 2)} is a relation.
relation	87.	{(0, 2), (1, 3)} is a set of ordered pairs. Therefore, {(0, 2), (1, 3)} is a ☐.
relation *or* set of ordered pairs	88.	{(1, 3), (3, 1), (5, 1)} is a ☐.
pairs	89.	{-6, 4, -3, 1} is **not** a relation, since {-6, 4, -3, 1} is not a set of ordered ☐.
No	90.	Is {5, 2, 1} a relation? ☐ *(Yes or no?)*
relation	91.	Since {(2, 0)} is a set of one ordered pair, {(2, 0)} is a ☐.
{(-1, 3), (-2, 3)} *or* {(-2, 3), (-1, 3)}	92.	Let $P = \{-1, -2\}$ and let $Q = \{3\}$. $P \times Q =$ ☐.
ordered pairs	93.	For all sets *A* and *B*, $A \times B$ is a set of ☐ ☐.
relation	94.	For all sets *A* and *B*, since $A \times B$ is a set of ordered pairs, $A \times B$ is a ☐.
pairs	95.	A relation is a set of ordered ☐.
relation	96.	A ☐ is a set of ordered pairs.
a set of ordered pairs	97.	A relation is ☐.

Chapter 15. BINARY OPERATIONS

binary operation	64.	If the **domain** of an operation is a **set of** ordered pairs, the **operation** is called a **binary operation**. × is a ☐ ☐.
two	65.	The word **binary** contains the Latin prefix **bi**, meaning twice, which, in English, is used as a prefix meaning two. A **bicycle** has ☐ *(how many?)* wheels?
two	66.	Ordered pairs contain ☐ *(how many?)* elements.
ordered pairs	67.	× is a **binary operation** because its domain is made up of ☐ ☐.
binary operation	68.	Because its domain is made up of ordered **pairs**, × is a ☐ ☐.
relation	69.	The domain of a binary operation is a **set of ordered pairs**. Therefore, the domain of a binary operation is a r☐.

9
4

93. **Binary operations can be represented by tables. We can express a subset of the operation × as follows:**

$$2\times2=4;\ 2\times3=6;\ 3\times2=6;\ 3\times3=\boxed{}.$$

We can then express it by this table, with the same information in different form:

×	2	3
2	☐	6
3	6	9

(Complete the table by filling in the box.)

6, 12, 16
6, 12, 16

94. **2×3 = ☐; 3×4 = ☐; 4×4 = ☐.**
Complete this table for another subset of ×:

×	2	3	4
2	4	☐	8
3	6	9	☐
4	8	12	☐

25
49

95. **Complete this table representing a subset of ×:**

×	4	5	6	7
4	16	20	24	28
5	20	☐	30	35
6	24	30	36	42
7	28	35	42	☐

Chapter 19. COMMUTATIVE OPERATIONS

sleeves	**1.**	**The result of rolling up your sleeves, either right then left or left then right, is that both ☐ are rolled up. Either order gives the same result.**
socks	**2.**	**Putting on socks before shoes ends with the shoes outside. Putting on shoes before socks ends with the ☐ outside.**

No.	3.	We have two **orders** for putting on socks and shoes: first socks, then shoes, and first shoes, then socks. Do these two different **orders** produce the same result? ☐ *(Yes or no?)*
Yes.	4.	Suppose that you have two mathematics textbooks to study: *Introductory Calculus* and *Advanced Calculus*. Does the **order** in which you study these books make any difference? ☐ *(Yes or no?)*
No.	5.	Suppose that you have two fiction books to read: *Treasure Island* and *Buck Rodgers Explores the Canals of Mars*. Does the **order** in which you read these make any difference? ☐ *(Yes or no?)*
2	6.	If we multiply 2 by 3, the **product** is equal to the product we get when we multiply 3 by ☐.
3	7.	If we add 3 to 2, the **sum** is the same as when we add 2 to ☐.
commutative +	33.	Consider any operation $*$. If $*(a, b) = *(b, a)$ for any a, b in a set S, we say that the set S is **commutative** with respect to $*$. Let $\mathbf{R} = \{\text{the real numbers}\}$, $p \in \mathbf{R}$, and $q \in \mathbf{R}$. Since $+(p, q) = +(q, p)$, we say that $\mathbf{R}$ is [com] with respect to the operation ☐.
p commutative	34.	A set S is commutative with respect to an operation $*$ if $*(a, b) = *(b, a)$ whenever $a \in S$ and $b \in S$. If we have specified the set S, we will use the abbreviation '$*$ **is a commutative operation**'. Let us specify that we are considering $\mathbf{R}$. If $p \in \mathbf{R}$ and $q \in \mathbf{R}$, $+(p, q) = +(q,$ ☐$)$. Therefore, we say that + is a ☐ operation.
3 commutative operation	35.	When we say that any operation $*$ is a commutative operation, we mean that the **order** of two elements with respect to $*$ can be reversed without altering the **result** of the operation. The expressions '3 + 1' and '1 + ☐' give the same result, 4, because + is a ☐ ☐.
mutate	36.	The word **'mutation'** means a change: if a thing **mutates,** it changes; if you change something, you [m e] it.
commutative	37.	The word **'commutative'** is built on the word **'mutate'**. When the **order** of two elements in an operation $*$ can be **changed** without altering the result, we call $*$ a [com ive] operation.
image	38.	$+(a, b) = c$; $+(b, a) = c$. + is a commutative operation, since both (a, b) and (b, a) have the same ☐ under +, where a and b are any real numbers.

Chapter 26. EQUATIONS, PRONUMERALS, AND SOLUTION SETS

True.	20.	Equations and inequations are symbols for statements. '5 = 3 + 2' is a symbol for a statement. Is the statement true or false? ☐
false	21.	Some statements are true and some statements are false. If an equation stands for a **true statement,** we will say that the equation is a **true equation.** If an equation stands for a **false** statement, we will say that the equation is a ☐ equation.
false	22.	'5 = 3 + 1' is an equation. '5 = 3 + 1' is a ☐ *(true or false?)* equation.

Chapter 26., EQUATIONS, PRONUMERALS, AND SOLUTION SETS

2	55.	$5 + \triangle = 7.$ Since only a numeral for 2 can replace '△' to make a true equation, the **solution set** of this equation is {☐}.
1	56.	$3 + y = 4.$ Since only a numeral for 1 can replace 'y' to make a true equation, the **solution set** of this equation is {☐}.
{3} *(Don't forget the set braces.)*	57.	$4 + \triangle = 7.$ Since only a numeral for 3 can replace '△' to make a true equation, the **solution set** of this equation is ☐.
2	58.	$5 + \triangle = 7.$ To make a true equation, we must replace '△' with a numeral for ☐.
set	59.	$5 + x = 9.$ The solution ☐ of this equation is {4}.
{1}	60.	☆ + 1 = 2. The solution set of this equation is ☐.
solution set	61.	$9 + a = 16.$ {7} is the ☐ ☐ of this equation.
{2}	62.	$5 + ? = 7.$ The solution set of this equation is ☐.
solution set	63.	$t + 5 = 11.$ The ☐ of this equation is {6}.
{11}	64.	$5 + 6 = \triangle.$ The solution set of this equation is ☐.

Chapter 28. IDENTITIES, EXPRESSIONS, AND TERMS

Yes.	123.	If two equations have the **same** solution set, then we say that the two equations are **equivalent equations**. Are '$x+2 = 5$' and '$x=3$' equivalent equations? ☐ *(Yes or no?)*
equivalent solution set	124.	'$y-3 = 5$' and '$y-2 = 6$' are ☐ equations because they have the same ☐ ☐.
equivalent they have the same solution set	125.	'$\beta = -6$' and '$\beta - 2 = -8$' are ☐ equations because ☐.
No. *(The solution sets are {4} and {8}.)*	126.	Are '$y+2 = 6$' and '$y-3 = 5$' equivalent equations? ☐ *(Yes or no?)*
$y = 3$	127.	Since '$y = 3$' and '$y+2 = 5$' are equivalent equations, we can say that '$y = 3$' is equivalent to '$y+2 = 5$' and that '$y+2 = 5$' is equivalent to '☐'.
basic.	128.	If one expression of an equation has only **one** term, a **pronumeral** completely alone, and the other expression contains no pronumeral at all, then we say that the equation is a **basic** equation. '$x = 3$' is a $\boxed{b\quad}$ equation.

basic equation	129.	'$x - y$' is not a ☐ ☐.
Yes.	130.	Is '$2 = y$' a basic equation? ☐ *(Yes or no?)*
pronumeral	131.	'$x = 2x - 3$' is ***not*** a basic equation. There is a ☐ in both expressions.
No.	132.	Is '$x = 2x - 6$' a basic equation? ☐ *(Yes or no?)*
No.	133.	'$t + 1 = 2$' is ***not*** a basic equation, since the left expression contains two terms, not just the pronumeral. Is '$m - 3 = 17$' a basic equation? ☐ *(Yes or no?)*
a, c, and d	134.	Which of the following are basic equations? ☐ a) $x = 4$. b) $x - 2 = 6$. c) $y = 2$. d) $2 = y$. e) $x = 2x - 4$.
Yes.	135.	'$b = 2 + 1$' and '$3(2) + 4 = b$' are both basic equations. Is '$t = 4(-3) + 1$' a basic equation ? ☐ *(Yes or no?)*
No.	136.	'$2q = 6$' is ***not*** a basic equation, since the left expression does not contain 'q' alone. Is '$5t = 25$' a basic equation? ☐ *(Yes or no?)*
alone	137.	'$-x = 6$' is ***not*** a basic equation either, since the pronumeral 'x' is not completely ☐ in the left expression.
a, b, and f	138.	Which of the following are basic equations? ☐ a) $a = -6$. b) $2 + 1 = q$. c) $-12 = -h$. d) $6h + 1 = 7$. e) $5b = 17$. f) $b = 4(6) + 17$.
7	139.	The solution sets of basic equations are very easy to find. What is the solution set of '$t = 2(3) + 1$'? {☐}

Chapter 30. ONE-STEP EQUATIONS

7	23.	$3 + 4 = k - 4 + 4$. The expression '$3 + 4$' can be simplified to only one term. '$3 + 4$' is equivalent to '☐'.
k	24.	$3 + 4 = k - 4 + 4$. The expression '$k - 4 + 4$' can also be simplified to only one term. '$k - 4 + 4$' is equivalent to '☐'.
k	25.	If '$3 + 4$' is equivalent to '7' and '$k - 4 + 4$' is equivalent to 'k', then '$3 + 4 = k - 4 + 4$' must be equivalent to '$7 =$ ☐'.
7 equivalent	26.	'$3 = k - 4$' is equivalent to '$3 + 4 = k - 4 + 4$'. '$7 = k$' is also equivalent to '$3 + 4 = k - 4 + 4$'. Therefore, '$3 = k - 4$' and '☐ $= k$' must be ☐ to each other.

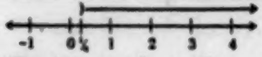
{7}	27.	The solution set of '7 = k' is ☐.
solution sets {7}	28.	Since '7 = k' and '3 = k − 4' are equivalent, their ☐ must be equal. Therefore, the solution set of '3 = k − 4' is ☐.
adding expressions	29.	3 = k − 4. 7 = k. We have taken a non-basic equation and transformed it into an equivalent basic equation whose solution set was easy to find. We transformed the equation by ☐ the same number to the values of both of its ☐.
7	30.	Solve 'b − 7 = 3'. Adding 7 to the values of both expressions gives us 'b − 7 + ☐ = 3 + 7'.
equivalent b	31.	'b − 7 + 7 = 3 + 7' can be simplified to the ☐ equation '☐ = 10'.
{10}	32.	The solution set of 'b = 10' is ☐.
{10}	33.	We start with 'b − 7 = 3'. By adding 7 to the value of both expressions we transform 'b − 7 = 3' into 'b = 10', which is a basic equation equivalent to 'b − 7 = 3'. The solution set of 'b = 10' is {10}. Therefore, the solution set of 'b − 7 = 3' is ☐.
basic equation	34.	We can easily solve a non-basic equation if we can transform it into an equivalent basic equation. The solution set of the non-basic equation will be the same as the solution set of the ☐ ☐.
equivalent	35.	The first step in solving a non-basic equation is to transform it into a basic equation that is ☐ to the non-basic equation.
basic	36.	If we add the same number to the values of both expressions of an equation, we transform the equation into an equivalent equation. However, to solve our equation we want to transform it into an equivalent ☐ equation.
expressions pronumeral	37.	To obtain a basic equation, we must isolate the pronumeral in one expression. In other words, we must know which number to add to the values of both ☐. The addition of this number must isolate the ☐ in one expression.

Chapter 35. WORD PROBLEMS

f 200 3 +	79.	One-third of a forest was destroyed in a fire, and then 200 more trees were cut down, leaving 1200 trees. How many trees were there before the fire? Let f be the original number of trees. Then $1200 = \frac{\square}{3} - \square$. This equation is equivalent to $f = \square(1200 \square 200)$.
original posts ½ 24	80.	A dance floor was held up by supporting posts. When people started doing rock and roll, half as many more posts were needed as there were originally. When the new posts were added, there were 24 all together. How many posts were there originally? If p is the ☐ number of ☐, then $p + \square p = \square$.

windows closed 2	81.	A house has 30 windows. Half of them face south, and a third of the remaining ones face west. If it rained in from the west, how many windows should be closed? If w is the number of [w] to be [c], then $w = \frac{30}{\square} \cdot \frac{1}{3}$.
one No. *(The solution set of '$32+88+s = 130$' is $\{10\}$. This means there will still be 22 seconds of green light in which to cross the street, since $32 - 10 = 22$.)*	82.	Suppose it takes you 130 seconds to walk a block. The green light lasts 32 seconds, and the red light lasts 88 seconds. If the green light at the next corner is just starting as you begin the block, will you have to wait for the light when you reach the corner? The equation for this problem is '$32+88+s = 130$', where s is the difference between the number of seconds it takes to walk the block and the number of seconds for one green and ☐ *(how many?)* red light(s). Will you have to wait for the light? ☐ *(Yes or no?)*

Chapter 37. SOLVING INEQUALITIES

-3	62.	To find a basic inequality that is equivalent to '$z+3<7$', we must add ☐ *(what number?)* to the value of each expression.
$z<4$ *or* $z<7-3$	63.	If we add -3 to the value of each expression of '$z+3<7$', we get the equivalent basic inequality '☐'.
solution set	64.	'$z<4$' is equivalent to '$z+3<7$'. Both of these inequalities have the same [s] [s].
$\{z: z<4\}$	65.	What is the solution set of '$z<4$'? ☐
$\{z: z<4\}$	66.	What is the solution set of '$z+3<7$'? ☐
$t>7\frac{2}{3}$ *(Add 7 to the value of each expression.)*	67.	Write a basic inequality that is equivalent to '$t-7>\frac{2}{3}$'. ☐
$\{t: t>7\frac{2}{3}\}$	68.	'$t>7\frac{2}{3}$' is equivalent to '$t-7>\frac{2}{3}$'. What is the solution set of '$t-7>\frac{2}{3}$'? ☐
$\{\Delta: \Delta>1\}$	69.	What is the solution set of '$\Delta+10>11$'? ☐
$\{r: r>2\frac{1}{3}\}$	70.	What is the solution set of '$r+6\frac{2}{3}>9$'? ☐
 *(The solution set is $\{p: p>\frac{1}{3}\}$.)*	71.	Graph the solution set of '$p+\frac{2}{3}>1$'. ☐

NUMBER BASES AND BINARY ARITHMETIC
MADELEINE L. MICHAEL, Programer, Learning Inc.
SHEILA LEVINSKY, Programer, Learning Inc.
BURL NEILSEN, Mathematics Instructor, Anchorage High School, Anchorage, Alaska
Published by CORONET INSTRUCTIONAL FILMS, 65 E. So. Water Street, Chicago 1, Illinois

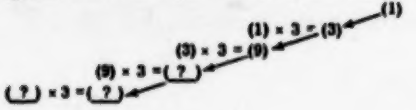
Programed text, 331 frames, paper back, 68 pp., 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "...Small representative samplings at appropriate grade levels tested informally on one-to-one basis with programer. Small representative samplings under controlled conditions (Dukane Redi-tutor using 35 mm. film) for each revision of program. Program has been through 4 complete revisions, each revision based on data obtained from formal machine testing. Field testing in progress: Classroom testing from 9th through 10th grades, administered by classroom teachers. Test areas distributed geographically from Florida to California. All testing conducted by Learning Incorporated."
Prerequisites: "Grade 9 reading level. Ability to perform the four arithmetic operations."
Average Time: 4 hours, 25 minutes (based entirely on data); standard deviation, 59.3 minutes.
Next Revision: "The published program is the final revision."
(1 sample page)

MATHEMATICS

NUMBER BASES AND BINARY ARITHMETIC
Michael, Levinsky, Neilsen; CORONET INSTRUCTIONAL FILMS
one sample page:

2-24 When you multiply each place value by 3 you get the next higher place value of the base-3 system. The first five place values of base-3 are:



(27);
(27); (81)

•

2-25

21022 in base-3 = 2(81) + 1(27) + 0(9) + 2(3) + 2(1)
Remember that, just as in decimal numerals, the ones place is always at the __(?)__ (right/left).

right

•

2-26 Fill in the missing place values:

Base-3	(81)	(?)	(9)	(3)	(1)
Base-5	(625)	(125)	(?)	(5)	(1)
Base-2	(16)	(8)	(4)	(2)	(?)
Base-6	(1,296)	(216)	(36)	(?)	(1)

(27);
(25);
(1);
(6)

•

2-27 (32), (16), (8), (4), (2), (1)
These place values are in a base-(?) system. Since the base is the number of digits used, this system uses only __(?)__ digits.

2;
two

•

2-28 (27), (9), (3), (1)
These place values are in a system which uses __(?)__ digits.

three

•

2-29

Place value	(512)	(64)	(8)	(1)
Method	64 × 8	8 × 8	1 × 8	■

This chart shows how the four lowest place values in some system are obtained. The base of the system which uses these place values is (?).

8

SEVENTH GRADE MATHEMATICS

DANIEL P. MURPHY, Britannica Center for Studies in Learning

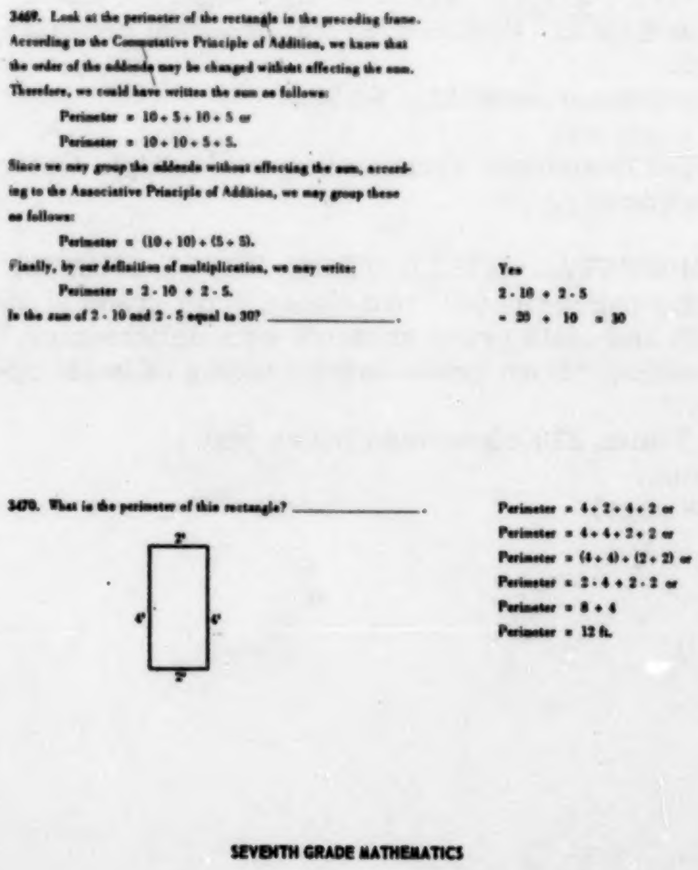
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 4,777 frames, paperback, 70 pp., 8-1/2" x 11-1/2", $13.25. Available in 4 separate units.
For use in TEMAC BINDER, $1.25; program reusable, $12.00.
Teacher's Manual available, $1.00.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Other using population(s): "Advanced sixth grade students; eighth and ninth grade students with deficiencies."
Prerequisites: "Sixth grade understanding of basic operations."
Average Time: 120 classroom hours (est.).
No Revision.
(1 sample page)

MATHEMATICS

SEVENTH GRADE MATHEMATICS
Murphy; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



3469. Look at the perimeter of the rectangle in the preceding frame. According to the Commutative Principle of Addition, we know that the order of the addends may be changed without affecting the sum. Therefore, we could have written the sum as follows:

Perimeter $= 10 + 5 + 10 + 5$ or

Perimeter $= 10 + 10 + 5 + 5$.

Since we may group the addends without affecting the sum, according to the Associative Principle of Addition, we may group these as follows:

Perimeter $= (10 + 10) + (5 + 5)$.

Finally, by our definition of multiplication, we may write:

Perimeter $= 2 \cdot 10 + 2 \cdot 5$.

Is the sum of $2 \cdot 10$ and $2 \cdot 5$ equal to 30? ________________.

Yes

$2 \cdot 10 + 2 \cdot 5$

$= 20 + 10 = 30$

3470. What is the perimeter of this rectangle? ________________.

Perimeter $= 4 + 2 + 4 + 2$ or

Perimeter $= 4 + 4 + 2 + 2$ or

Perimeter $= (4 + 4) + (2 + 2)$ or

Perimeter $= 2 \cdot 4 + 2 \cdot 2$ or

Perimeter $= 8 + 4$

Perimeter = 12 ft.

SEVENTH GRADE MATHEMATICS

MATHEMATICS - SETS Elem.

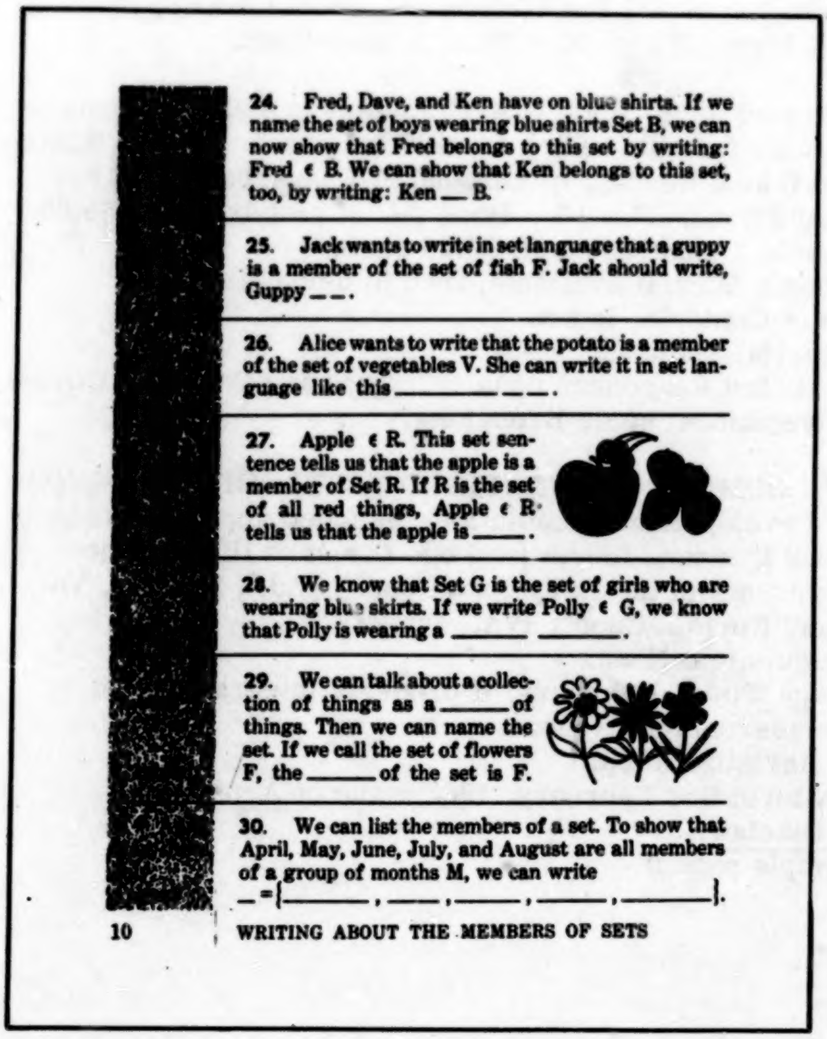
ARITHMETIC WITH SETS
Book 4, Progressive Elementary Mathematics Series
ARITHMETIC IN USE
Book 5, Progressive Elementary Mathematics Series
FRANK W. BANGHART, Director and Staff, Mathematical Research Laboratories.
Published by NOBLE AND NOBLE, PUBLISHERS, Inc.,
67 Irving Place, New York 3, New York.

Programed texts, Book 4: 4200 frames & 460 test items in frame format, Book 5: 4100 frames & 410 test items in frame format, clothbound and paperback, 512 pp. each book, 8" x 10", Book 4 & 5: clothbound at $5.88 each, 2 paperbacks at $2.24 each.
Teacher's Manual available, free to using teachers.
Table of Contents, Index.
Unit test(s) included.
Constructed Responses usually used; some Multiple Choice Responses; some Branching.

DEVELOPMENTAL AND (FIELD TEST) POPULATION(S): "Developmental populations included approximately one thousand fourth [and one thousand fifth] grade students in the Baltimore County (Md.), Norfolk, Va., and Norfolk County (Va.) schools."
Prerequisites: None.
Average Time: 120 hours, if properly integrated with classroom activities.
Next Revision: 1968.
Literature: See February, 1963 issue of Arithmetic Teacher.
(8 sample pages)

MATHEMATICS - SETS

ARITHMETIC WITH SETS
ARITHMETIC IN USE
Banghart; NOBLE AND NOBLE, PUBLISHERS
8 sample pages:



24. Fred, Dave, and Ken have on blue shirts. If we name the set of boys wearing blue shirts Set B, we can now show that Fred belongs to this set by writing: Fred $\in$ B. We can show that Ken belongs to this set, too, by writing: Ken ___ B.

25. Jack wants to write in set language that a guppy is a member of the set of fish F. Jack should write, Guppy ___ ___.

26. Alice wants to write that the potato is a member of the set of vegetables V. She can write it in set language like this ________ ___ ___.

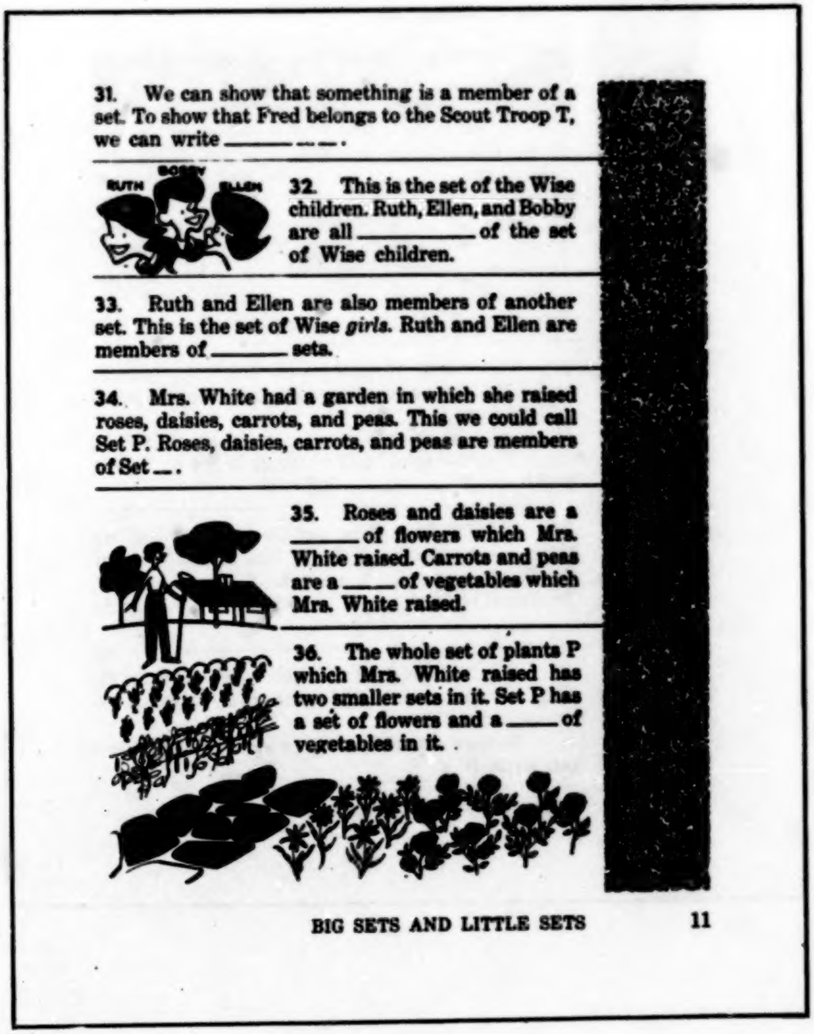
27. Apple $\in$ R. This set sentence tells us that the apple is a member of Set R. If R is the set of all red things, Apple $\in$ R tells us that the apple is _____.

28. We know that Set G is the set of girls who are wearing blue skirts. If we write Polly $\in$ G, we know that Polly is wearing a ______ ______.

29. We can talk about a collection of things as a ______ of things. Then we can name the set. If we call the set of flowers F, the ______ of the set is F.

30. We can list the members of a set. To show that April, May, June, July, and August are all members of a group of months M, we can write
___ = {_______, _____, _______, _______, ________}.

10 WRITING ABOUT THE MEMBERS OF SETS


RUTH
BOBBY
ELLEN

31. We can show that something is a member of a set. To show that Fred belongs to the Scout Troop T, we can write ______ __ __.

32. This is the set of the Wise children. Ruth, Ellen, and Bobby are all ______ of the set of Wise children.

33. Ruth and Ellen are also members of another set. This is the set of Wise *girls*. Ruth and Ellen are members of ______ sets.

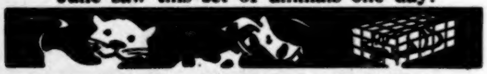
34. Mrs. White had a garden in which she raised roses, daisies, carrots, and peas. This we could call Set P. Roses, daisies, carrots, and peas are members of Set __.

35. Roses and daisies are a ______ of flowers which Mrs. White raised. Carrots and peas are a ______ of vegetables which Mrs. White raised.

36. The whole set of plants P which Mrs. White raised has two smaller sets in it. Set P has a set of flowers and a ______ of vegetables in it.

37. Many sets have smaller sets in them. *Subset* is a word we use to talk about a set which is part of, or *inside*, a larger set.

Jane saw this set of animals one day:



The set of white animals is a subset of the set of all the animals she saw. The set of spotted animals is a ________ of all the animals she saw.

---

38. The set of Wise children, W = {Ruth, Ellen, Bobby}, has 2 subsets inside it. They are Subset F (girls) and Subset J (boy).

{Ruth, Ellen} = F　　{Bobby} = J

Sets F and J are ________ of Set W.

---

39. This is a set of numbers: {2, 3, 4, 5, 6} = Set N. In Set N there is a set of *even* numbers A and a set of *odd* numbers B.

{2, 4, 6} = A, the set of even numbers in Set N. {3, 5} = B, the set of odd numbers in Set N. Sets A and B are ________ of Set N.

---

40. Ted, Bill, Jack, Jane, and Sue form one spelling team, which we will call Set R. Jane is a member of Set R. We write this in set language as Jane $\in$ R. To show that Sue is a member of Set R, we could write

________.

---

41. Ted, Bill, and Jack are each members of Set R. They are also members of a subset of R, which we can call Subset B.

To show that Subset B is a subset of Set R, we can write B $\subseteq$ R.

42. Jane and Sue, the girls, are also a subset of Set R. We can call them Subset G. To show that Subset G is a subset of R, we can write G ⊆ R, because both members of Subset G are members of Set ___.

43. Betsy has a blue sweater, a green sweater, and a white sweater. We can call this the _____ of Betsy's sweaters.

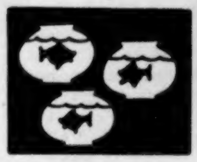
44. We can make subsets from the set of Betsy's sweaters. We can put each of the 3 sweaters into a set by itself. We will then have ____________ B, ____________ G, and ____________ W.

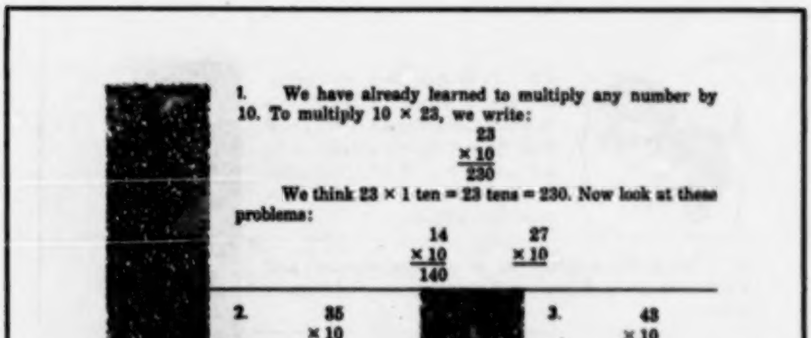
45. We can make other subsets from Betsy's set of 3 sweaters. We can make a subset with B and G in it. We can make a __________ with B and W in it. We can make a __________ with G and W in it.

46. To show that Set B is a subset of Set S (the set of all Betsy's sweaters), we can write B ___ S.

47. Joan wants to write that F is a subset of Set K. Joan should write F ___.

48. Bill has 3 fish, and Fred has 3 fish bowls. If they put 1 fish in each bowl, they will see that they have the same number of fish and bowls. There will be ___ fish or bowls left over.





1. We have already learned to multiply any number by 10. To multiply 10 × 23, we write:

$$\begin{array}{r}23\\ \times 10\\ \hline 230\end{array}$$

We think 23 × 1 ten = 23 tens = 230. Now look at these problems:

$$\begin{array}{r}14\\ \times 10\\ \hline 140\end{array} \qquad \begin{array}{r}27\\ \times 10\\ \hline \end{array}$$

2. $\begin{array}{r}35\\ \times 10\\ \hline \end{array}$

3. $\begin{array}{r}43\\ \times 10\\ \hline \end{array}$

4. 64 × 10 = ____

5. 78 × 10 = ____

6. We also know how to multiply numbers like 20 × 24. We write:

$$\begin{array}{r}24\\ \times 20\\ \hline \end{array}$$

and think 24 × 2 tens = 48 tens = 480. Now look at these:

$$\begin{array}{r}16\\ \times 40\\ \hline 640\end{array} \qquad \begin{array}{r}34\\ \times 20\\ \hline \end{array}$$

7. $\begin{array}{r}16\\ \times 20\\ \hline \end{array}$

8. $\begin{array}{r}43\\ \times 70\\ \hline \end{array}$

9. $\begin{array}{r}24\\ \times 30\\ \hline \end{array}$

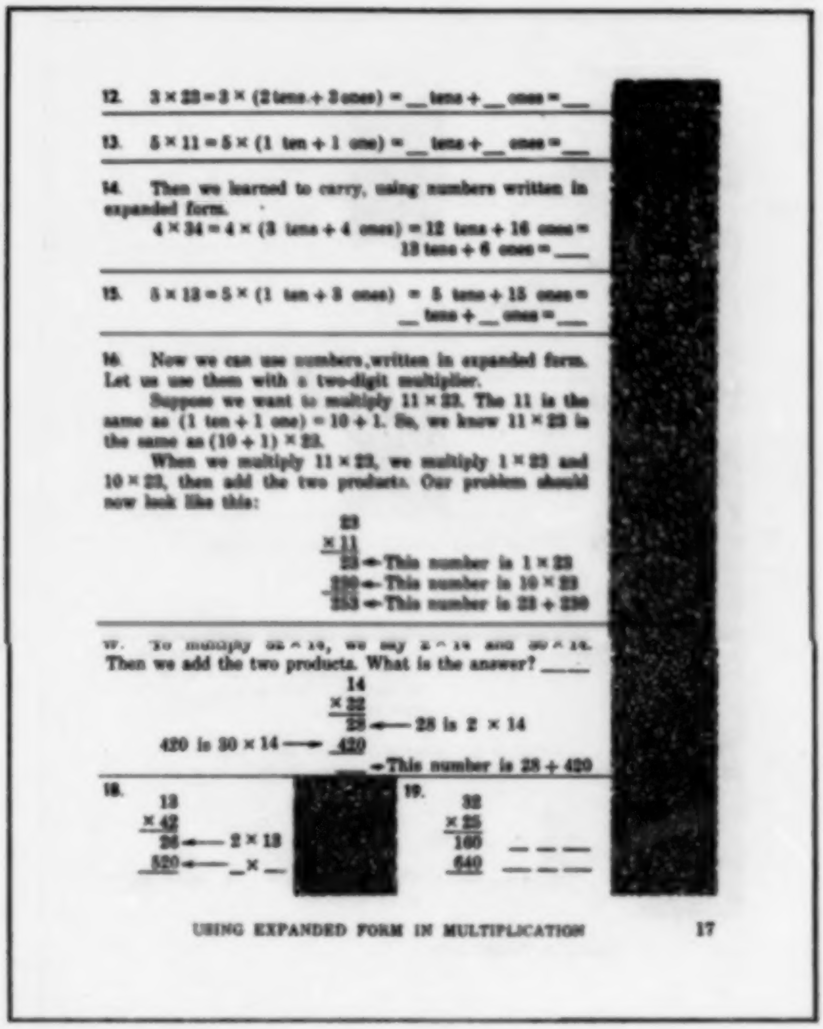
10. $\begin{array}{r}48\\ \times 50\\ \hline \end{array}$

11. When we learned to multiply two-digit numbers, we first looked at numbers written in *expanded form*. In expanded form, to multiply 2 × 23 we can write:

3 × (1 ten + 2 ones) = 3 tens + 6 ones = 36

So, to multiply 2 × 23 we can write:

2 × (2 tens + 3 ones) = 4 tens + 6 tens = ___



12. 3 × 23 = 3 × (2 tens + 3 ones) = __ tens + __ ones = __

13. 5 × 11 = 5 × (1 ten + 1 one) = __ tens + __ ones = __

14. Then we learned to carry, using numbers written in expanded form.

4 × 34 = 4 × (3 tens + 4 ones) = 12 tens + 16 ones =
13 tens + 6 ones = ___

15. 5 × 13 = 5 × (1 ten + 3 ones) = 5 tens + 15 ones =
__ tens + __ ones = ___

16. Now we can use numbers, written in expanded form. Let us use them with a two-digit multiplier.

Suppose we want to multiply 11 × 23. The 11 is the same as (1 ten + 1 one) = 10 + 1. So, we know 11 × 23 is the same as (10 + 1) × 23.

When we multiply 11 × 23, we multiply 1 × 23 and 10 × 23, then add the two products. Our problem should now look like this:

23
× 11
23 ← This number is 1 × 23
230 ← This number is 10 × 23
253 ← This number is 23 + 230

17. To multiply 32 × 14, we say 2 × 14 and 30 × 14. Then we add the two products. What is the answer? ____

14
× 32
28 ← 28 is 2 × 14
420 is 30 × 14 → 420
___ ← This number is 28 + 420

18.
13
× 42
26 ← 2 × 13
520 ← _ × _

[redacted]

19.
32
× 25
160 _ _ _
640 _ _ _

[redacted]

[redacted]

20.

$$\begin{array}{r} 47 \\ \times 37 \\ \hline 329 \\ 141 \\ \hline 1739 \end{array} \begin{array}{l} \leftarrow \underline{\quad} \times \underline{\quad} \\ \leftarrow \underline{\quad}\ \underline{\quad}\ \underline{\quad} \end{array}$$

[redacted]

21.

$$\begin{array}{r} 53 \\ \times 46 \\ \hline \\ \underline{\qquad} \\ 2438 \end{array} \begin{array}{l} \leftarrow 6 \times 53 \\ \leftarrow 40 \times 53 \end{array}$$

---

22. $\begin{array}{r} 63 \\ \times 34 \\ \hline \end{array}$

This number is 4 × 63.
____ This number is 30 × 63.
This number is the sum of 4 × 63 and 30 × 63.

---

23. $\begin{array}{r} 75 \\ \times 46 \\ \hline \\ \underline{\qquad} \end{array}$

[redacted]

24. $\begin{array}{r} 83 \\ \times 24 \\ \hline \\ \underline{\qquad} \end{array}$

---

25. We can use a "short cut" when we multiply.

$$\begin{array}{r} 83 \\ \times 24 \\ \hline 332 \\ 1660 \\ \hline 1992 \end{array}$$

← You have seen that we always have a zero in this place. Why? Because we are always multiplying by a number that ends in a zero: 20 × 83 = 1660.

We need not write down that zero. But we must remember to put all the other numbers in their right places.

$$\begin{array}{r} 83 \\ \times 24 \\ \hline 332 \\ 166\underline{\ \ } \end{array}$$

← This is where the zero would go, if we wrote it.

[redacted]

26.

$$\begin{array}{r} 47 \\ \times\, 31 \\ \hline 47 \end{array}$$

47 ← This number is 47 × 1

This number is 47 × 30 → ____ ← Don't write the zero!

---

27. *When we use this shorter way of multiplying, we multiply the multiplicand by each digit in the multiplier. Remember to move the second row over one place to the left (to the tens place).*

$$\begin{array}{r} 47 \\ \times\, 31 \\ \hline 47 \\ 141\_ \end{array}$$

47 ← This is 1 × 47.

141 ← This is 3 × 47. We moved 141 ____ place to the left.

28.

$$\begin{array}{r} 97 \\ \times\, 43 \\ \hline 291 \\ 388\_ \end{array}$$

291 ← This is __ × ___.

388 ← This is ___ ___ ___. We remembered to move 388 one place to the left.

29.

$$\begin{array}{r} 66 \\ \times\, 57 \\ \hline 462 \\ 330\_ \\ \hline 3762 \end{array}$$

This is __ × __ → 462

330 ← This is __ × __

We moved 330 one place to the left.

30.

$$\begin{array}{r} 51 \\ \times\, 26 \\ \hline \_\_\_ \end{array}$$

[redacted]

31.

$$\begin{array}{r} 28 \\ \times\, 94 \\ \hline \_\_\_ \end{array}$$

INTRODUCTION TO SETS
EUGENE D. NICHOLS
ROBERT KALIN
HENRY GARLAND, all of Florida State Univ.
Published by: HOLT, RINEHART & WINSTON,
383 Madison Ave., N. Y. 17, N.Y.

Programed text, 255 frames, paperback, 72 pp., 7" x 10", $.96
Teacher's Manual available, $.16.
Table of Contents.
Final Test included.
Constructed Responses usually used, some Multiple Choice, no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Grades 7 thru 12."
Prerequisites: "Familiarity and skill in computing with counting numbers."
Average Time: 2-4-1/2 hours (est.).
Next Revision: Unknown.
(1 sample page)

MATHEMATICS-SETS

INTRODUCTION TO SETS
Nichols, Kalin, Garland; HOLT, RINEHART & WINSTON
one sample page:

80 Tell how many members there are in each set.
(a) The set of counting numbers between 5 and 8. ______
(b) The set of counting numbers between 5 and 7. ______
(c) The set of counting numbers between 5 and 6. ______

STOP STOP

80 (a) Two (b) One (c) None or Zero

81 You saw that the set of counting numbers between 5 and 6 has no members.
The set of counting numbers between 5 and 6
is a word-description of the empty set.
The empty set is the set that has no members.
The set of counting numbers between 8 and 9 is the ________ set.

STOP STOP

81 empty

82 A symbol for the empty set is $\emptyset$.
(Draw a circle with a slash through it.)
The empty set, $\emptyset$, is the set that has no members.
A word-description of the empty set, $\emptyset$, is
the set of all three-legged birds.
Which descriptions describe $\emptyset$?
(a) The set of counting numbers between 106 and 107.
(b) The set of green stripes in the U.S. flag.
(c) {6}.
(d) The set of women presidents of the U.S.

STOP STOP

82 (a), (b), (d)

83 The set of five-sided triangles is the ____________ set. The
(word)
symbol used to represent this set is ____.

STOP STOP

83 empty, $\emptyset$

84 Which description describes $\emptyset$?
(a) The set of even numbers between 3 and 17.
(b) The set of even numbers between 3 and 5.
(c) The set of even numbers between 4 and 6.

______

STOP STOP

MATHEMATICS - SETS H.S.-Coll.

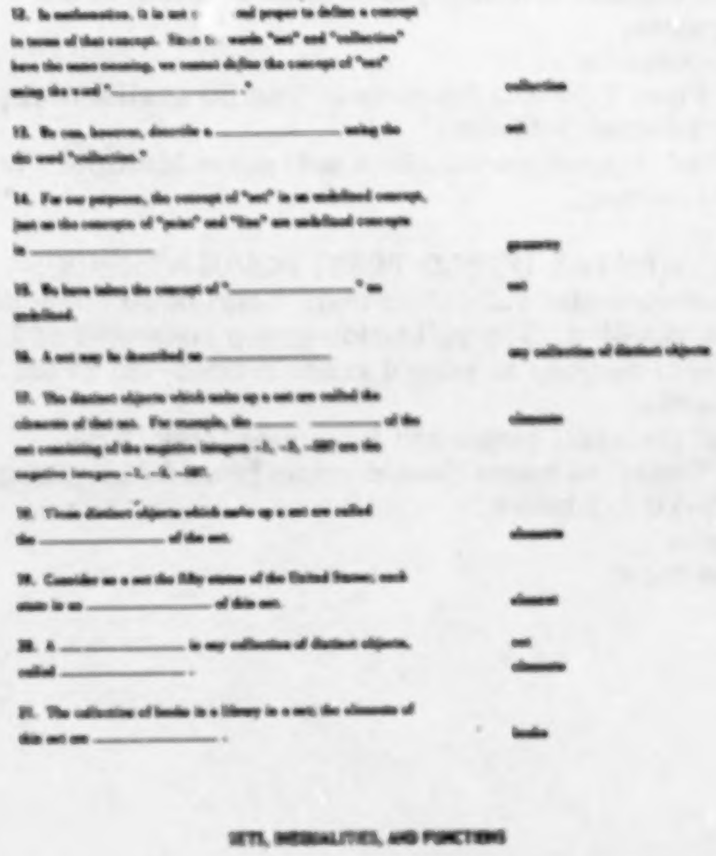
AN INTRODUCTION TO SETS, INEQUALITIES, AND FUNCTIONS
Introduction to Analytic Geometry
CLAUDE THOMPSON, Associate Professor of Mathematics, Hollins College
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1,605 frames, paperback, 8-1/2" x 11-1/2", $11.50, available in 3 separate units.
For use in TEMAC BINDER, $1.25; program reusable, $10.25.
Teacher's Manual available, $1.00.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Selected students developmentally, Roanoke City Public Schools for field test evaluation."
Other using population(s): "Professional review in modern mathematics."
Prerequisites: "High school algebra and trigonometry."
Average Time: 25 classroom hours for average students (est.).
No Revision.
(1 sample page)

MATHEMATICS - SETS

AN INTRODUCTION TO SETS, INEQUALITIES, AND FUNCTIONS
Thompson; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



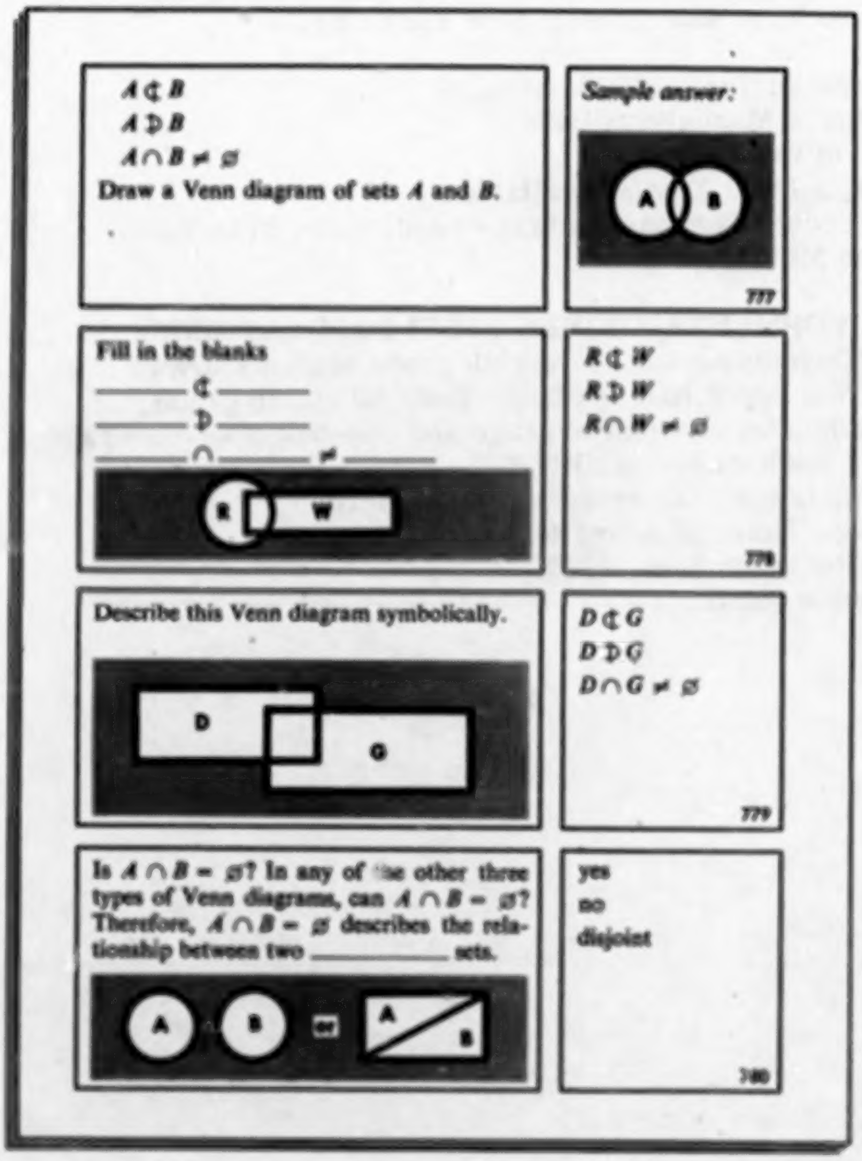
LANGUAGE OF SETS
DONALD COOK, Basic Systems, Inc.
Published by: APPLETON-CENTURY-CROFTS, LYONS & CARNAHAN,
34 West 33rd Street, New York 1, N.Y.

Programed text, 797 frames, hard bound, 264 pp., 7 1/2" x 10", $2.60
Teacher's Manual available, free upon adoption of 10 programs.
Table of Contents.
Unit and Final Test and Diagnostic Test(s) available free with Teacher's Manual.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental validation test: Total of 26 students were sampled. The validation group consisted of 12 students ranging in school grade from 6-9th grade."
Prerequisites:
Additional material required: Response Book, $.64.
Average Time: 14 hours (based entirely on data). Range: 7 1/2-20 1/2 hours.
No Revision
(1 sample page)

MATHEMATICS-SETS

LANGUAGE OF SETS
Cook; APPLETON-CENTURY-CROFTS, LYONS & CARNAHAN
one sample page:



$A \not\subset B$ $A \not\supset B$ $A \cap B \neq \varnothing$ Draw a Venn diagram of sets A and B.	*Sample answer:* 777
Fill in the blanks ______ ⊄ ______ ______ ⊅ ______ ______ ∩ ______ ≠ ______	$R \not\subset W$ $R \not\supset W$ $R \cap W \neq \varnothing$ 778
Describe this Venn diagram symbolically.	$D \not\subset G$ $D \not\supset G$ $D \cap G \neq \varnothing$ 779
Is $A \cap B = \varnothing$? In any of the other three types of Venn diagrams, can $A \cap B = \varnothing$? Therefore, $A \cap B = \varnothing$ describes the relationship between two ______ sets.	yes no disjoint 780

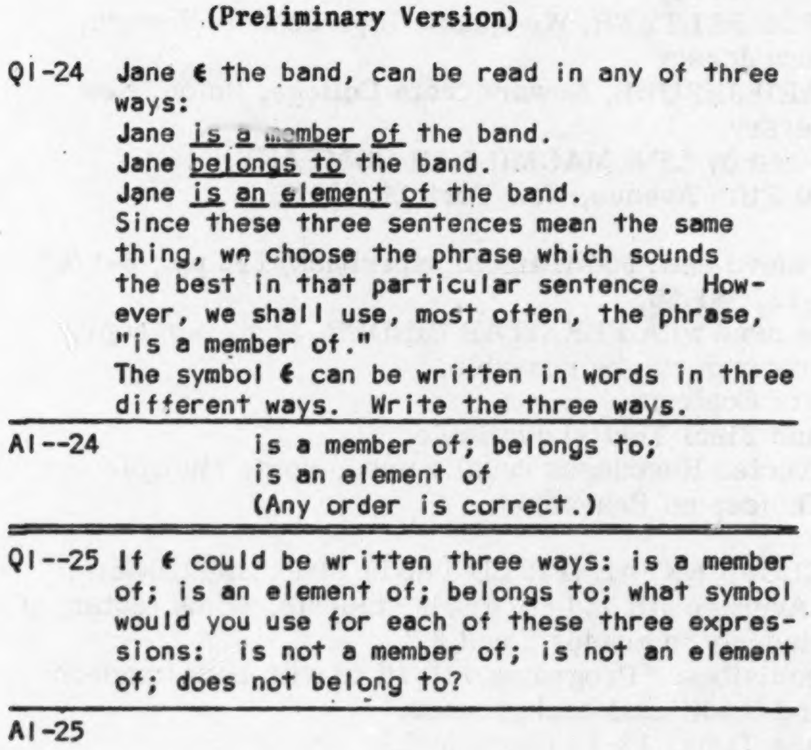
SETS, EQUATIONS, AND INEQUALITIES
MILDRED REIGH, Mathematics Dept.
J. WILLIAM MOORE, Education Dept.
WENDELL SMITH, Psychology Dept., all of Bucknell University.
Published by McGRAW-HILL BOOK COMPANY, Inc., 330 West 42nd Street, New York City.

Programed Text, 2000 frames, $____.
Teacher's Manual available.
Table of Contents.
Unit and Final Test(s) available.
Constructed Responses always used; some Branching, no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental: 12 eighth grade students drawn from upper half of class. Test: 90 eighth grade students, one-half average and one-half above average in mathematics ability."
Prerequisites: "Knowledge of arithmetic."
Average Time: 52 hours (est.).
Next Revision: June, 1963.
(1 sample page)

MATHEMATICS-SETS

SETS, EQUATIONS, AND INEQUALITIES
Reigh, Moore, Smith; McGRAW-HILL BOOK COMPANY
one sample page:



(Preliminary Version)

QI-24 Jane ∈ the band, can be read in any of three ways:
Jane is a member of the band.
Jane belongs to the band.
Jane is an element of the band.
Since these three sentences mean the same thing, we choose the phrase which sounds the best in that particular sentence. However, we shall use, most often, the phrase, "is a member of."
The symbol ∈ can be written in words in three different ways. Write the three ways.

AI--24 is a member of; belongs to;
is an element of
(Any order is correct.)

QI--25 If ∈ could be written three ways: is a member of; is an element of; belongs to; what symbol would you use for each of these three expressions: is not a member of; is not an element of; does not belong to?

AI-25

SETS, OPERATIONS, AND CIRCUITS
An Introduction to Set Theory
VERNON L. DAUSCH, Milburn Junior High School, New Jersey
MARTIN M. MOSKOWITZ, Vailsburg High School, Newark, New Jersey
ERNEST R. RANUCCI, Newark State College, Union, New Jersey
MORTON SELTZER, Weequahic High School, Newark, New Jersey
EDWARD J. ZOLL, Newark State College, Union, New Jersey
Published by THE MACMILLAN COMPANY,
60 Fifth Avenue, New York 11, N. Y.

Programed text, 500 frames, paperback, 112 pp., 8-1/4" x 11", $1.50.
Can be used with FLEXITAB BINDER, $1.67 per copy, program can be reusable.
Table of Contents.
Unit and Final Test(s) available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Average 7th and 8th grade students. Some testing of students in grades 5 and 6."
Prerequisites: "Programs will fit in with both 'modern' and traditional backgrounds."
Average Time: 12-15 hours (est.).
Next Revision:
(1 sample page)

MATHEMATICS-SETS

SETS, OPERATIONS, AND CIRCUITS

Dausch, Moskowitz, Ranucci, Seltzer, Zoll; THE MACMILLAN COMPANY

one sample page:

17. The set, *Even numbers between 11 and 15*, contains —?— elements.

a. two b. three c. five

a. two

18. 8 —?— a member of the set, *Even numbers between 11 and 15.*

a. is b. is not

b. is not

19. 14 —?— a member of the set, *Even numbers between 11 and 15.*

a. is b. is not

a. is

20. Mickey Mouse —?— a member of the set, *Even numbers between 11 and 15.*

a. is b. is not

b. is not

21. The name of a set tells us what is included in the ________

set

22. When we deal with a set, we often need to know what the set contains. Often the ________ of the set tells us what is included in the set.

name

23. Two members of the set, *Cities in California*, are —?— and —?—.

a. San Francisco b. Chicago c. Los Angeles d. Paris

a. San Francisco
c. Los Angeles

24. You can tell which of the cities above belong to the set because you know the —?— of the set.

a. size b. name c. direction

b. name

SETS, RELATIONS, AND FUNCTIONS
A Programmed Introduction to Modern Mathematics

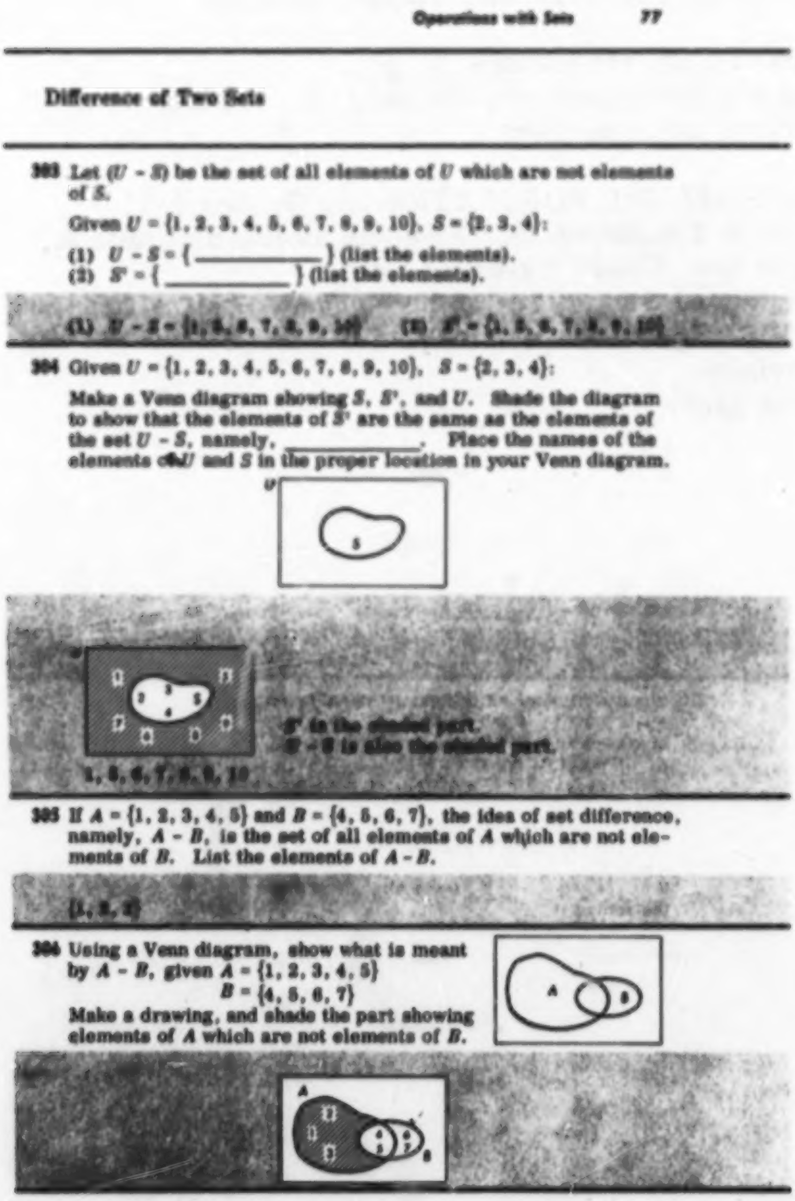
MYRA McFADDEN, mathematics teacher and programer
WENDELL SMITH, Psychology Dept., Bucknell University
WILLIAM MOORE, Education Dept., Bucknell University.
Published by McGRAW-HILL BOOK COMPANY, Inc.,
330 West 42nd Street, New York City.

Programed text, 1150 frames, paperback and hardcover, 300 pp., 6" x 9", $3.95 paper edition; $5.95 cloth edition.
Teacher's Manual available.
Unit and Final tests "contained in Teacher's Manual, no extra charge." Diagnostic tests "contained in program."
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: "Knowledge of high school algebra and geometry is recommended."
Additional equipment required: "Ruler and graph paper."
Average Time: 28 hours (est.). "Recommend 4 weeks use within semester's work."
Next Revision:
(1 sample page)

MATHEMATICS-SETS

SETS, RELATIONS, AND FUNCTIONS
McFadden, Smith, Moore; McGRAW-HILL BOOK COMPANY
one sample page:



Operations with Sets 77

Difference of Two Sets

303 Let $(U - S)$ be the set of all elements of U which are not elements of S.

Given $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $S = \{2, 3, 4\}$:

(1) $U - S = \{$ ____________ $\}$ (list the elements).
(2) $S' = \{$ ____________ $\}$ (list the elements).

(1) $U - S = \{1, 5, 6, 7, 8, 9, 10\}$ (2) $S' = \{1, 5, 6, 7, 8, 9, 10\}$

304 Given $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $S = \{2, 3, 4\}$:

Make a Venn diagram showing S, S', and U. Shade the diagram to show that the elements of S' are the same as the elements of the set $U - S$, namely, ____________. Place the names of the elements of U and S in the proper location in your Venn diagram.

S' is the shaded part.
$U - S$ is also the shaded part.

1, 5, 6, 7, 8, 9, 10

305 If $A = \{1, 2, 3, 4, 5\}$ and $B = \{4, 5, 6, 7\}$, the idea of set difference, namely, $A - B$, is the set of all elements of A which are not elements of B. List the elements of $A - B$.

$\{1, 2, 3\}$

306 Using a Venn diagram, show what is meant by $A - B$, given $A = \{1, 2, 3, 4, 5\}$
$B = \{4, 5, 6, 7\}$
Make a drawing, and shade the part showing elements of A which are not elements of B.

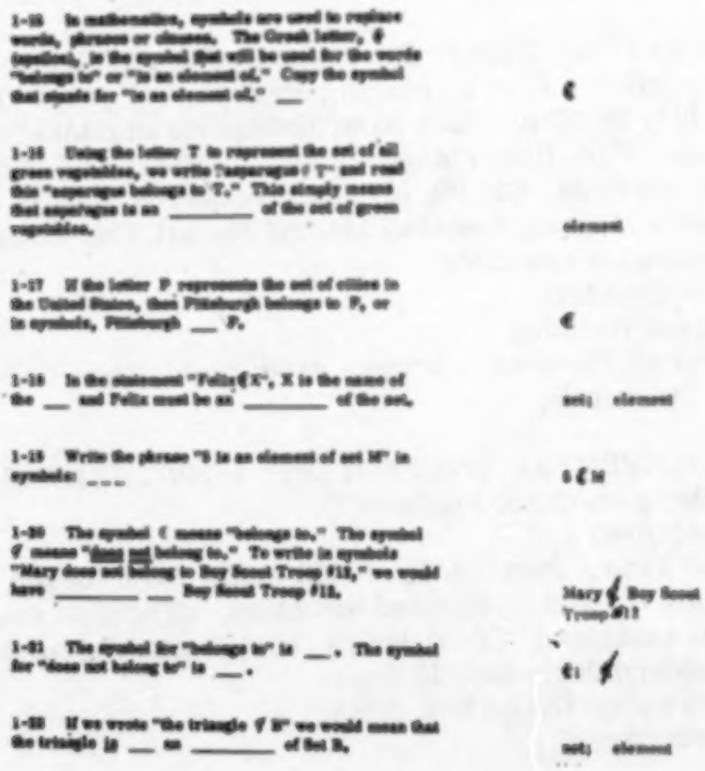
THEORY OF SETS
JOAQUIN BUSTOZ, Programer, Learning Incorporated
SHIRLEY FRYE, Mathematics Instructor, Arcadia High School, Scottsdale, Arizona.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 415 frames, $3.50.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL POPULATION(S): Grades 9-11.
Other Using Population(s): "Subjects as low as grade 5."
Prerequisites: Grade 9 reading level.
Average Time: 3 hours, 46 minutes (based entirely on data); standard deviation, 37.6 minutes.
Next Revision:
(1 sample page)

MATHEMATICS - SETS

THEORY OF SETS
Bustoz, Frye; LEARNING INCORPORATED
one sample page:



1-15 In mathematics, symbols are used to replace words, phrases or clauses. The Greek letter, ∈ (epsilon), is the symbol that will be used for the words "belongs to" or "is an element of." Copy the symbol that stands for "is an element of." ___	∈
1-16 Using the letter T to represent the set of all green vegetables, we write "asparagus ∈ T" and read this "asparagus belongs to T." This simply means that asparagus is an ________ of the set of green vegetables.	element
1-17 If the letter P represents the set of cities in the United States, then Pittsburgh belongs to P, or in symbols, Pittsburgh ___ P.	∈
1-18 In the statement "Felix ∈ X", X is the name of the ___ and Felix must be an ________ of the set.	set; element
1-19 Write the phrase "5 is an element of set M" in symbols: ___	5 ∈ M
1-20 The symbol ∈ means "belongs to." The symbol ∉ means "does not belong to." To write in symbols "Mary does not belong to Boy Scout Troop #12," we would have ________ ___ Boy Scout Troop #12.	Mary ∉ Boy Scout Troop #12
1-21 The symbol for "belongs to" is ___. The symbol for "does not belong to" is ___.	∈; ∉
1-22 If we wrote "the triangle ∉ B" we would mean that the triangle is ___ an ________ of Set B.	not; element

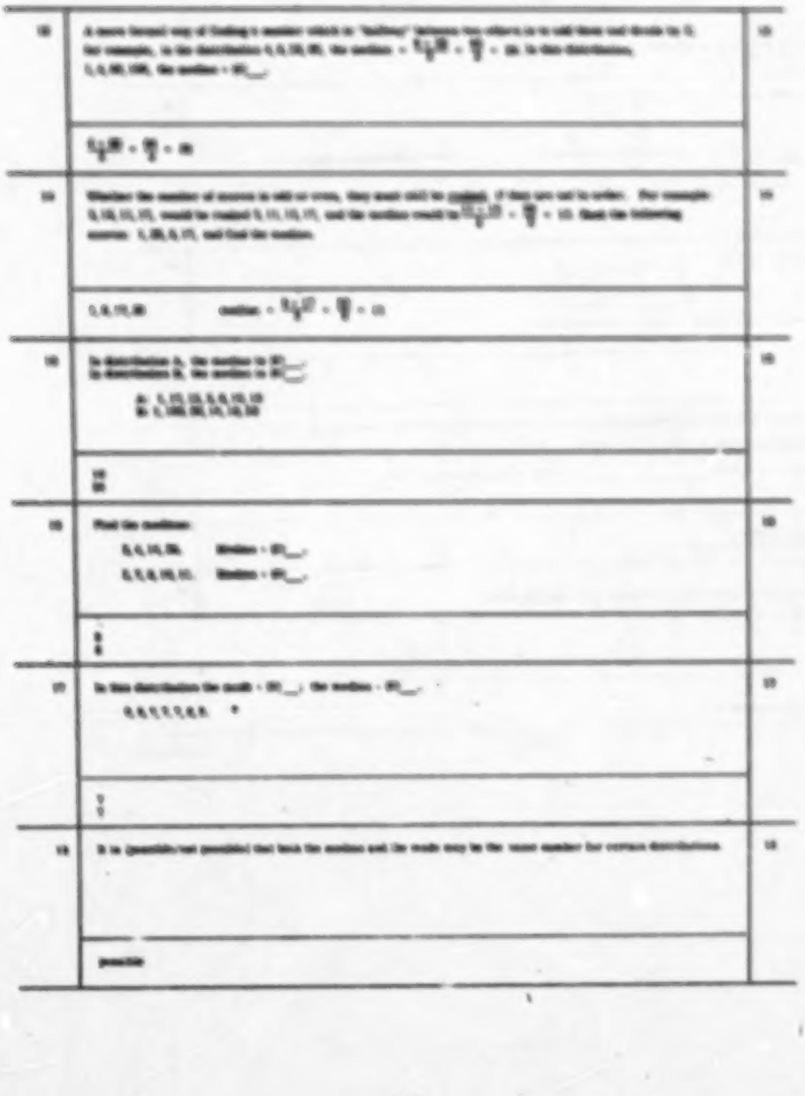
ADVANCED MATHEMATICS SERIES: INTRODUCTORY STATISTICS
Part I: Descriptive Statistics; Part II: Statistical Inference
JAMES L. EVANS
LLOYD E. HOMME, both of Teaching Materials Corporation
Published by TEACHING MATERIALS CORPORATION
575 Lexington Avenue, New York 22, New York

Programed text, Part I: 836 frames; Part II: 830 frames, paperback, Part I: 143 pp.; Part II: 141 pp., 8-1/2" x 11", $6.00 for each part; both parts combined $11.00.
Part I and Part II combined for use in MIN/MAX II teaching machine, $25.00; program reusable, $10.00.
Teacher's Manual: General Manual for all TMI-Grolier programs available.
Table of Contents.
Final Test included.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Eleventh-grade students."
Prerequisites:
Average Time: Part I & II: 10-15 hours each (based entirely on data); standard deviation, 12 hours. Part I & II combined: 20-35 hours (based entirely on data); standard deviation, 12 hours.
Next Revision: December, 1963.
(2 samnle pages)

MATHEMATICS-STATISTICS

ADVANCED MATHEMATICS SERIES: INTRODUCTORY STATISTICS
Evans, Homme; TEACHING MATERIALS CORPORATION
2 sample pages



43

Suppose you take 5 samples of 1,000,000 scores each. You then compute the means of the samples and get [illegible]. What is the median of this sampling distribution of means? (8)___

[illegible]

43

44

Suppose you have a sampling distribution of some statistic, such as the variance or mode. You can [illegible] [illegible]. If you get the standard deviations of several samples, and then get the mode of these standard deviations, you would have (WHAT)___

The mode of a sampling distribution of standard deviations.

44

45

Given these samples:

The sampling distribution of means has the scores [illegible], ___, ___. The mode of the sampling distribution of means is (8)___

[illegible]

45

46

Given these samples:

The range of the sampling distribution of medians is (8)___

[illegible]

46

47

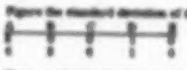
The standard deviation of the sampling distribution of means is important enough to have a special name. It is called the STANDARD ERROR OF THE MEAN. So if you get the means of a group of samples, and then figure the (WHAT)___ of these means, you have the (WHAT)___

standard deviation
standard error of the mean.

47

48

Figure the standard deviation of the means in the samples below.



(8)___

The special name for this standard deviation is (WHAT)___

[illegible]
standard error of the mean.

48

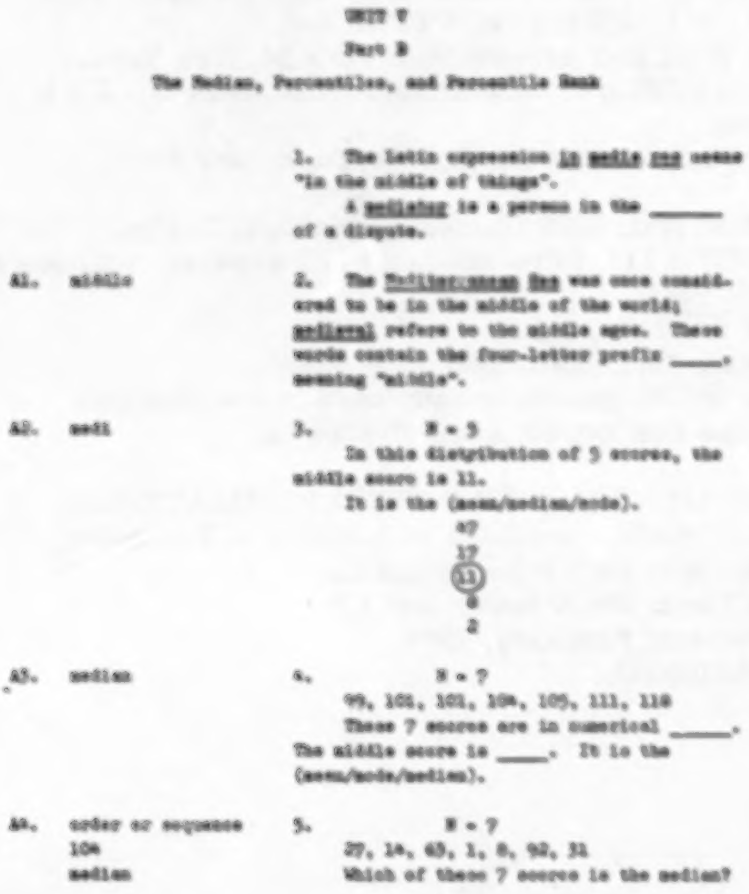
DESCRIPTIVE STATISTICS
A Behavioral Approach
LASSAR G. GOTKIN
LEO S. GOLDSTEIN, both of The Center for Programed Instruction, Inc.
Experimental Edition published by THE CENTER FOR PROGRAMED INSTRUCTION, Inc.
365 West End Avenue, New York 24, New York.
Published Edition to be available from JOHN WILEY & SONS,
440 Park Avenue South, New York, New York.

Programed text, 2000 frames, paperback, 250 pp.,
8 1/2" x 11", to be available in 3 separate volumes at $2.50 each.
Table of Contents, Index.
Unit, Final, Diagnostic Test(s) available.
Constructed Responses usually used; some Multiple Choice Responses; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Individuals from Fashion Institute of Technology."
Prerequisites: High School algebra.
Average Time: 25-30 hours (est.).
Next Revision: February, 1964.
(2 sample pages)

MATHEMATICS-STATISTICS

DESCRIPTIVE STATISTICS
Gotkin, Goldstein; THE CENTER FOR PROGRAMED INSTRUCTION
2 sample pages:



UNIT V

Part B

The Median, Percentiles, and Percentile Rank

	1. The Latin expression in medio res means "in the middle of things". A mediator is a person in the ______ of a dispute.
A1. middle	2. The Mediterranean Sea was once considered to be in the middle of the world; medieval refers to the middle ages. These words contain the four-letter prefix _____, meaning "middle".
A2. medi	3. N = 5 In this distribution of 5 scores, the middle score is 11. It is the (mean/median/mode). 47 17 ⑪ 8 2
A3. median	4. N = 7 99, 101, 101, 104, 105, 111, 118 These 7 scores are in numerical ______. The middle score is _____. It is the (mean/mode/median).
A4. order or sequence 104 median	5. N = 7 27, 14, 63, 1, 8, 92, 31 Which of these 7 scores is the median?

From:Unit I, Part A - Population & Sample (Panel II has not been included.)	13. Each election year public opinion pollsters like George Gallup, Elmo Roper and Louis Harris predict the outcome of the voting. These men poll (the entire voting population/a sample of the voting population). Why?
A13. A sample of the voting population. It is too costly and time consuming to poll the entire voting population.	14. Time and cost are not the only reasons why you might use a sample. If you wanted to know how many miles wear you could expect from a manufacturer's automobile tires, would you use (a sample of the tires/all the tires). Why?
A14. A sample. If you tested all of the tires you would have none left to sell.	15. Refer to Panel II Who won the election for Governor in New York State in 1958? What percentage of the total vote did he receive?
A15. Rockefeller 55%	16. Did Rockefeller receive a majority of the votes in New York City? (yes/no)
A16. No. He received only 43% of the New York City votes.	17. If a large sample of New York City voters were polled before the election, the results would probably suggest that (Harriman/Rockefeller) would win.
A17. Harriman	18. A pollster wishing to predict the winner of an election for the state governor takes a large sample of voters living in the state's largest city. Is it likely that his sample will provide a satisfactory approximation of state-wide results.
A18. No. He will probably obtain a biased sample. The pollster has "tasted only the pie crust." It is likely that he will have introduced a systematic bias since the voting patterns of residents of large cities usually differ from those of rural and suburban areas.	

ELEMENTARY STATISTICS,
Part I: Descriptive Statistics
HOWARD W. ALEXANDER, Prof. of Math., Earlham College
ROLAND F. SMITH, Prof. of Math., Earlham College
Published by: EARLHAM COLLEGE,
Richmond, Indiana

Programed text, 350 frames, Paperback, 78 pp., 8 1/2" x 11", $2.50.
Available in French (partly.)
Table of Contents.
Unit Test(s) available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"A series of classes in Elementary Statistics at Earlham College."
Prerequisites: Ninth-grade algebra.
Average Time: 8 hours (based entirely on data).
Next Revision: 1963 or 1964.
(1 sample page)

MATHEMATICS-STATISTICS

ELEMENTARY STATISTICS
Alexander, Smith; EARLHAM COLLEGE
one sample page:

1.1 Statistics is concerned with observations. These may be either numberical observations or non-numerical observations. For example, measuring the height of each student in a group would give rise to a set of ____ observations. Classifying the workers in a factory according to sex, on the other hand, would give rise to a set of ____ observations.

Answer: Numerical. Non-numerical.

Copyright 1960
Earlham College

1.2 When observations are classified, the classes into which they fall are called categories. Thus a classification of the workers in a factory according to sex would use the categories ____ and ____.

Answer: Male, female.

15.20 Suppose that for a certain distribution a code u is set up such that the mean and standard deviation of u are $\bar{u} = -.59$ and $s_u = 1.51$. If X and u are related by the equation $X = iu + X_0 = 5u + 275$, then the mean of X is $\bar{X} =$ ____, and the standard deviation of X is $s_x =$ ____.

Answer: $\bar{X} = 5(-.59) + 275 = -2.95 + 275 = 272.05$.
$s_x = 5(1.51) = 7.55$.

15.21 The advantage of using a code, u, is that the resulting computations usually involve much ____ numbers than if the original X-values were used.

Answer: Smaller.

AN INTRODUCTION TO PROBABILITY
BOYD EARL, Mathematics Dept., Wilkes College
J. WILLIAM MOORE, Education Dept., Bucknell University
WENDELL SMITH, Psychology Dept., Bucknell University
Published by McGRAW-HILL BOOK COMPANY, Inc.,
330 West 42nd Street, New York City.

Programed text, 1050 frames, hard and papercover,
250 pp., 6" x 9", $3.95.
Teacher's Manual available.
Table of Contents, Index.
Unit and Final Test(s) available.
Constructed Responses always used; no Multiple Choice;
no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental: (1) 10 high school students enrolled in college preparatory program. (2) 15 high school students enrolled in program in modern algebra. Field test: (1) 50 high school students enrolled in college preparatory program. (2) 20 high school teachers. (3) 60 college freshmen in general mathematics."
Prerequisites: "Two years of high school algebra."
Average Time: 23 hours (based entirely on data).
Standard Deviation: 7 hours.
Next Revision: June, 1963.
(1 sample page)

MATHEMATICS-STATISTICS

AN INTRODUCTION TO PROBABILITY
Earl, Moore, Smith; McGRAW-HILL BOOK COMPANY
one sample page:

26. If the relative frequency of event A is one, we know that event A occurred every time the experiment was performed. Thus, if a coin was tossed seven times and the relative frequency of event H was one, (1) H appeared ______ times, that is, (2) n(H) = _____ .

Ans. (1) 7 (2) 7

*27. The largest possible value for the relative frequency of event A is ______. In this case, we know that the event A occurred every time that the experiment was performed.

Ans. 1

28. If a coin is tossed 10 times, and A is the occurrence of a head, the smallest possible value of n(A) is ______.

Ans. 0

*29. If an experiment is performed N times, the smallest possible value of n(A) for any event A is _______.

Ans. 0

INTRODUCTORY DESCRIPTIVE STATISTICS
With applications to Psychology

JOHN E. MILHOLLAND, Dept. of Psychology, University of Michigan

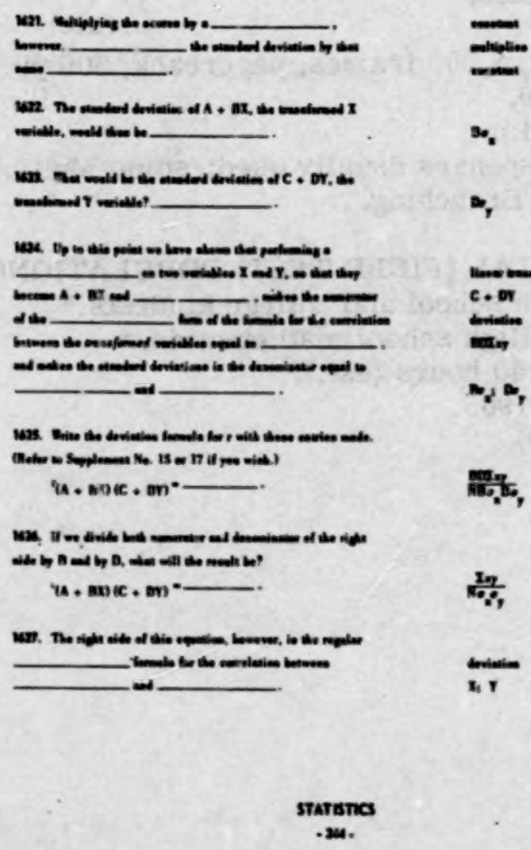
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 North Michigan Avenue, Chicago 11, Illinois

Programed text, 2,229 frames, paperback, 450 pp., 8 1/2" x 11"; $10.25. Bound in 2 separate volumes.
For use in TEMAC BINDER, $1.25; program reusable, $9.00.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Student population in psychology classes at University of Michigan."
Other using population(s): "Professional review; adult education."
Prerequisites: None.
Average Time: "50 Classroom hours for average students." (est.).
No Revision.
(1 sample page)

MATHEMATICS-STATISTICS

INTRODUCTORY DESCRIPTIVE STATISTICS
Milholland; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



1621. Multiplying the scores by a ______, however, ______ ______ the standard deviation by that same ______.	constant multiplies constant
1622. The standard deviation of A + BX, the transformed X variable, would then be ______.	$B\sigma_x$
1623. What would be the standard deviation of C + DY, the transformed Y variable? ______.	$D\sigma_y$
1624. Up to this point we have shown that performing a ______ on two variables X and Y, so that they become A + BX and ______ ______, makes the numerator of the ______ form of the formula for the correlation between the *transformed* variables equal to ______, and makes the standard deviations in the denominator equal to ______ ______ and ______.	linear transformation C + DY deviation BDΣxy $B\sigma_x$; $D\sigma_y$
1625. Write the deviation formula for *r* with these entries made. (Refer to Supplement No. 15 or 17 if you wish.) $r_{(A+BX)(C+DY)} =$ ______.	$\frac{BD\Sigma xy}{NB\sigma_x D\sigma_y}$
1626. If we divide both numerator and denominator of the right side by B and by D, what will the result be? $r_{(A+BX)(C+DY)} =$ ______.	$\frac{\Sigma xy}{N\sigma_x\sigma_y}$
1627. The right side of this equation, however, is the regular ______ formula for the correlation between ______ and ______.	deviation X; Y

STATISTICS
- 344 -

MATHEMATICS-STATISTICS H.S., Coll. & Grad. School

PROBABILITY AND STATISTICS - A PROGRAMMED COURSE OF INSTRUCTION
ALBERT E. HICKEY, President
SANFORD M. AUTOR, Director of Programming, Entelek, Inc.
Published by ADDISON-WESLEY Publishing Co., Inc. Reading, Mass.

Programed text, 3,000 frames, paperback, 500 pp., 8-1/2" x 11", $3.00.
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Senior high school and college students."
Prerequisites: High school mathematics.
Average Time: 40 hours (est.).
Next Revision: 1965.
(2 sample pages)

MATHEMATICS-STATISTICS

PROBABILITY AND STATISTICS - A PROGRAMMED COURSE OF INSTRUCTION
Hickey, Autor; ADDISON-WESLEY
2 sample pages:

PROBABILITY AND STATISTICS:
A Programmed Course of Instruction
Albert E. Hickey and Sanford M. Autor

The letters A and B can be ordered or arranged in a row as AB or _____.	BA
A and B can be ordered or arranged in a row in _____ (how many?) different ways.	2
Each different arrangement of A and B in order (AB or BA) is called a permutation. A permutation of a number of objects is any arrangement of these objects in a definite order. The _____ of A and B are AB and BA.	permutations
To "permute" objects is to arrange them in a row in a definite _____.	order
To _____ objects is to arrange them in a row in a definite order.	permute
AB and BA are permutations of the letters A and B. ABC and ACB are permutations of the three letters _____, taken all together.	A, B, and C
ABC and ACB are two possible _____ of A, B, and C, taken all together.	permutations
ABC and ACB are two permutations of A, B, and C. Other permutations of A, B, and C, taken all together, are _____, _____, _____, and _____.	BAC BCA CBA CAB
The permutations of A, B, and C, taken all together, are _____, _____, _____, _____, _____, and _____. There are _____ (how many?) permutations of A, B, and C, when taken all together.	ABC ACB BAC BCA CBA CAB 6

One random variable, X, in tossing a coin 3 times is the number of heads obtained. The first column of Panel VI-1 shows a _____ space for this experiment.	sample
A second variable, Y, in tossing a coin 3 times is the number of runs obtained. The sample point HHH represents one run of 3 heads. The same point TTT represents one ___ of 3 tails.	run
The sample point HHH has one run. The sample point TTT also has _____ run. The sample point HHT has two _____	one runs
HHT has two runs. The first run has exactly two H's. The second run has exactly one _____.	T
HHH has one run. HHT has two runs. HTT has _____ runs. HTH has _____ runs.	 two three
HHH has exactly 3 H's and 1 run. HHT has exactly _____ H's and _____ runs. HTT has exactly _____ H and _____ runs. HTH has exactly _____ H's and _____ runs.	2 2 1 2 2 3
Refer to Panel VI-1. The 2 random variables for the experiment are the _____ and the _____ when a coin is tossed 3 times in succession.	number of heads number of runs
Look at Panel VI-1. The random variable number of heads is denoted by _____. The random variable number of runs is denoted by _____.	X Y

MATHEMATICS-STATISTICS H.S.-Coll.+

A PROGRAMMED INTRODUCTION TO STATISTICAL CONCEPTS
CELESTE McCOLLOUGH
LOCHE VAN ATTA, both of Psychology Dept., Oberlin College.
Published by McGRAW-HILL BOOK COMPANY, Inc.
330 West 42nd Street, New York City.

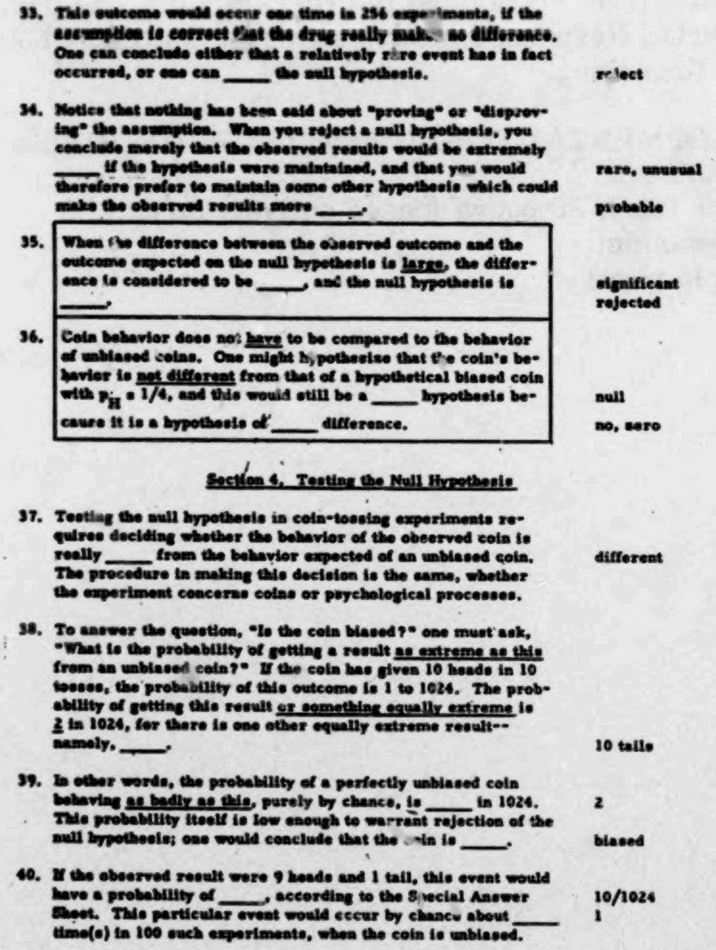
Programed text, 1200 frames, paperback and hardcover, 295 pp., 6" x 9", $3.95 paper edition; $5.95 cloth edition. Will also be available for use with KONCEPT-O-GRAPH machine.
Diagnostic tests "contained in program"; pre and post
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Average Time: 20 hours (based entirely on data).
Next Revision:
(1 sample page)

MATHEMATICS-STATISTICS

A PROGRAMMED INTRODUCTION TO STATISTICAL CONCEPTS

McCollough, Van Atta; McGRAW-HILL BOOK COMPANY
one sample page:



33. This outcome would occur one time in 256 experiments, if the assumption is correct that the drug really makes no difference. One can conclude either that a relatively rare event has in fact occurred, or one can _____ the null hypothesis.	reject
34. Notice that nothing has been said about "proving" or "disproving" the assumption. When you reject a null hypothesis, you conclude merely that the observed results would be extremely _____ if the hypothesis were maintained, and that you would therefore prefer to maintain some other hypothesis which could make the observed results more _____.	rare, unusual probable
35. When the difference between the observed outcome and the outcome expected on the null hypothesis is large, the difference is considered to be _____, and the null hypothesis is _____.	significant rejected
36. Coin behavior does not have to be compared to the behavior of unbiased coins. One might hypothesize that the coin's behavior is not different from that of a hypothetical biased coin with $p_H = 1/4$, and this would still be a _____ hypothesis because it is a hypothesis of _____ difference.	null no, zero

Section 4. Testing the Null Hypothesis

37. Testing the null hypothesis in coin-tossing experiments requires deciding whether the behavior of the observed coin is really _____ from the behavior expected of an unbiased coin. The procedure in making this decision is the same, whether the experiment concerns coins or psychological processes.	different
38. To answer the question, "Is the coin biased?" one must ask, "What is the probability of getting a result as extreme as this from an unbiased coin?" If the coin has given 10 heads in 10 tosses, the probability of this outcome is 1 to 1024. The probability of getting this result or something equally extreme is 2 in 1024, for there is one other equally extreme result--namely, _____.	10 tails
39. In other words, the probability of a perfectly unbiased coin behaving as badly as this, purely by chance, is _____ in 1024. This probability itself is low enough to warrant rejection of the null hypothesis; one would conclude that the coin is _____.	2 biased
40. If the observed result were 9 heads and 1 tail, this event would have a probability of _____, according to the Special Answer Sheet. This particular event would occur by chance about _____ time(s) in 100 such experiments, when the coin is unbiased.	10/1024 1

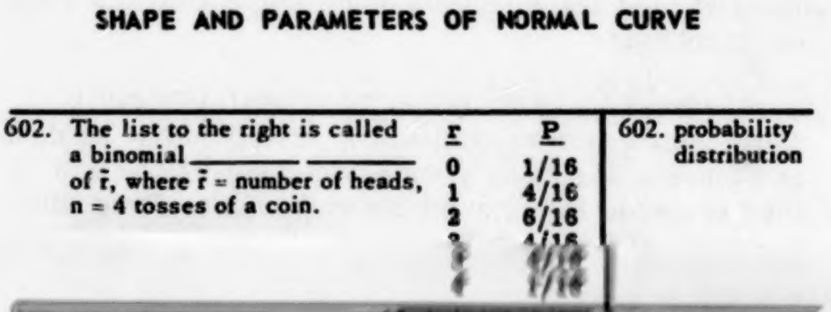
STATISTICS: PROBABILITY MODELS OF RANDOM PROCESSES
TECHNICAL STAFF, General Education, Inc.
Published by GENERAL EDUCATION, Inc.
96 Mt. Auburn St., Cambridge 38, Mass.

Programed text, 800 frames, loose leaf sheets for inclusion in three ringed notebook, 100 pp., 8 1/2" x 11", $5.00.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Program was developmentally tested on one student at a time under closely supervised conditions and then revised. Five revisions were made. Programer interviewed developmental test subjects at length."
Prerequisites: None.
Average Time: 8 hours (est.).
Next Revision: "None planned as yet."
(1 sample page)

MATHEMATICS-STATISTICS

STATISTICS: PROBABILITY MODELS OF RANDOM PROCESSES
Technical Staff; GENERAL EDUCATION
one sample page:



SHAPE AND PARAMETERS OF NORMAL CURVE

602. The list to the right is called a binomial ________ ________ of r̄, where r̄ = number of heads, n = 4 tosses of a coin.

r	P
0	1/16
1	4/16
2	6/16
3	4/16
4	1/16

602. probability distribution

MATHEMATICS-STATISTICS Jr. H.S.-H.S.

WHAT ARE THE CHANCES?
An Introduction to Probability
MARTIN M. MOSKOWITZ, Vailsburg H. S.
Published by THE MACMILLAN COMPANY,
60 Fifth Avenue, New York 11, New York

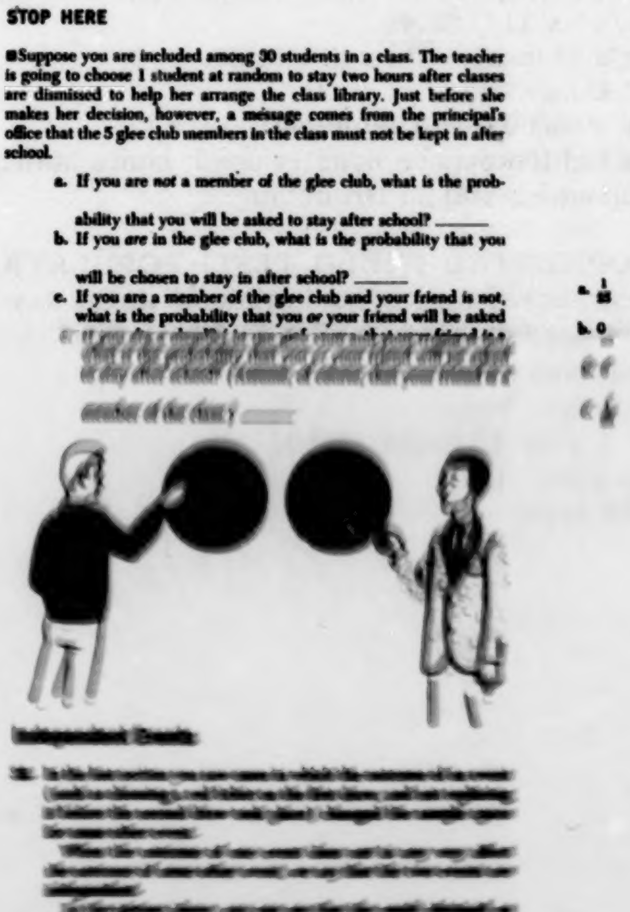
Programed text, 385 frames, 105 pp., paperback,
8-1/4" x 11", $1.48.
Teacher's Manual will be available.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses usually used; some Multiple Choice
Responses; and no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"New Jersey high school students at the seventh,

"New Jersey high school students at the seventh,
eighth and ninth grade levels."
Prerequisites: None.
Average Time: 10 hours (est.).
Next Revision: 1965.
(1 sample page)

MATHEMATICS-STATISTICS

WHAT ARE THE CHANCES?
Moskowitz; THE MACMILLAN COMPANY
one sample page:



STOP HERE

■Suppose you are included among 30 students in a class. The teacher is going to choose 1 student at random to stay two hours after classes are dismissed to help her arrange the class library. Just before she makes her decision, however, a message comes from the principal's office that the 5 glee club members in the class must not be kept in after school.

a. If you are *not* a member of the glee club, what is the probability that you will be asked to stay after school? ______

b. If you *are* in the glee club, what is the probability that you will be chosen to stay in after school? ______

c. If you are a member of the glee club and your friend is not, what is the probability that you *or* your friend will be asked

a. $\frac{1}{25}$

b. 0

MATHEMATICS-TRIGONOMETRY H.S.-Coll.

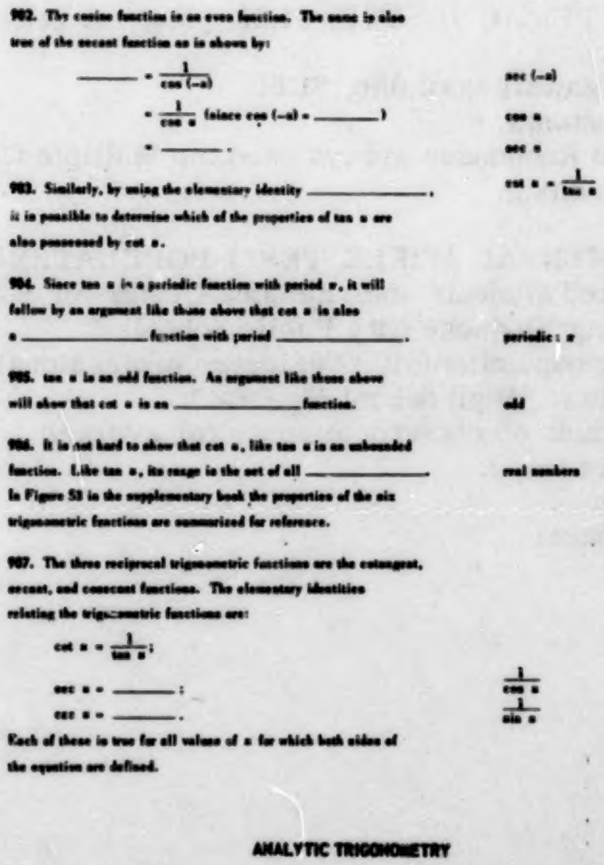
ANALYTIC TRIGONOMETRY
DAVID C. LUCKHAM, Mathematics Dept., Massachusetts Institute of Technology.
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 3,063 frames, paperback, 674 pp., 8-1/2" x 11-1/2", $18.50.
For use in TEMAC BINDER, $1.25; program reusable, $17.25.
Teacher's Manual available, $1.50.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Selected students at Britannica Center for Studies in Learning; Roanoke City Public Schools."
Other using population(s): "Engineers professional review."
Prerequisites: "High School algebra."
Average Time: 60 classroom hours for average students (est.).
No Revision.
(1 sample page)

MATHEMATICS-TRIGONOMETRY

ANALYTIC TRIGONOMETRY
Luckham; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



902. The cosine function is an even function. The same is also true of the secant function as is shown by:

$\_\_\_\_\_ = \frac{1}{\cos(-a)}$ — $\sec(-a)$

$= \frac{1}{\cos a}$ (since $\cos(-a) = \_\_\_\_\_$) — $\cos a$

$= \_\_\_\_\_$. — $\sec a$

903. Similarly, by using the elementary identity __________, it is possible to determine which of the properties of $\tan a$ are also possessed by $\cot a$. — $\cot a = \frac{1}{\tan a}$

904. Since $\tan a$ is a periodic function with period π, it will follow by an argument like those above that $\cot a$ is also a __________ function with period __________. — periodic; π

905. $\tan a$ is an odd function. An argument like those above will show that $\cot a$ is an __________ function. — odd

906. It is not hard to show that $\cot a$, like $\tan a$ is an unbounded function. Like $\tan a$, its range is the set of all __________. — real numbers
In Figure 53 in the supplementary book the properties of the six trigonometric functions are summarized for reference.

907. The three reciprocal trigonometric functions are the cotangent, secant, and cosecant functions. The elementary identities relating the trigonometric functions are:

$\cot a = \frac{1}{\tan a}$;

$\sec a = \_\_\_\_\_$; — $\frac{1}{\cos a}$

$\csc a = \_\_\_\_\_$. — $\frac{1}{\sin a}$

Each of these is true for all values of a for which both sides of the equation are defined.

ANALYTIC TRIGONOMETRY

TRIGONOMETRY
A Practical Course
NORMAN A. CROWDER, Vice President and Technical Director, Educational Science Div., U.S. Industries.
GRACE C. MARTIN, Assistant to the President, Educ. Science Div., U.S. Industries.
Published by: DOUBLEDAY & COMPANY, Inc., 575 Madison Avenue, N.Y.C.

Programed text, 247 frames, hard cover, 248 pp., 8 1/4" x 5 3/8", $4.95.
Table of Contents, Index.
Unit Test(s) included.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Average Time: 5-7 hours (est.).
Next Revision: "Not scheduled".
(1 sample page)

MATHEMATICS-TRIGONOMETRY

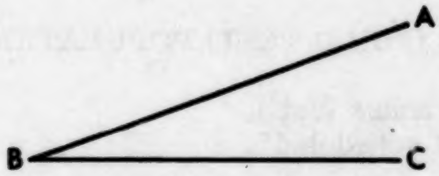
TRIGONOMETRY
Crowder, Martin; DOUBLEDAY & COMPANY
one sample page:

Sample from Trigonometry: A Practical Course

35

We are about to see how the ideas of ratio and proportion apply to the triangle.

You should know that an angle is a geometric figure formed by two line segments drawn from the same point, or vertex. Thus



An angle usually is designated by capital letters placed at the vertex and the sides of the angle, as shown above. In this case, we might speak of the diagram as showing angle ABC (with the vertex letter in the middle), or as $\angle ABC$, or just as $\angle B$.

Angles, as you know, are measured in degrees. A circle contains 360 degrees (360°).

You should remember the answer to this question:

How many degrees are there in a right angle?

45°.	page 29
90°.	page 38
100°.	page 42

TRIGONOMETRY I and II

LAURENCE WHISLER, Consultant in Programed Education, Central Scientific Co.
Published by CENTRAL SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

Planned for use in CENCO PROGRAMED LEARNER, $2.95; 100 problem items in I, 200 in II, 30 to 40 pp.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Planned sample of 100."
Prerequisites: None
Average Time: 3 hours (est.).
Next Revision: September, 1963.
(1 sample page)

MATHEMATICS-TRIGONOMETRY

TRIGONOMETRY I and II
Whisler; CENTRAL SCIENTIFIC COMPANY
one sample page:

TRIGONOMETRY I

32-1/2. Study relationships in triangle FGH

Sin angle HFG $\frac{GH}{HF}$

Cosin angle HFG $\frac{FG}{HF}$

Sin HFG $\frac{FG}{HF}$

Cos HFG $\frac{GH}{HF}$

. . . .

33. Given:

Point F is 44 meters east of point H.
Point F is 90 meters north of point H.
Line FH is 123 meters.

What is the consine of angle GHF?

a) .36 b) .43 c) .29

. . . .

a

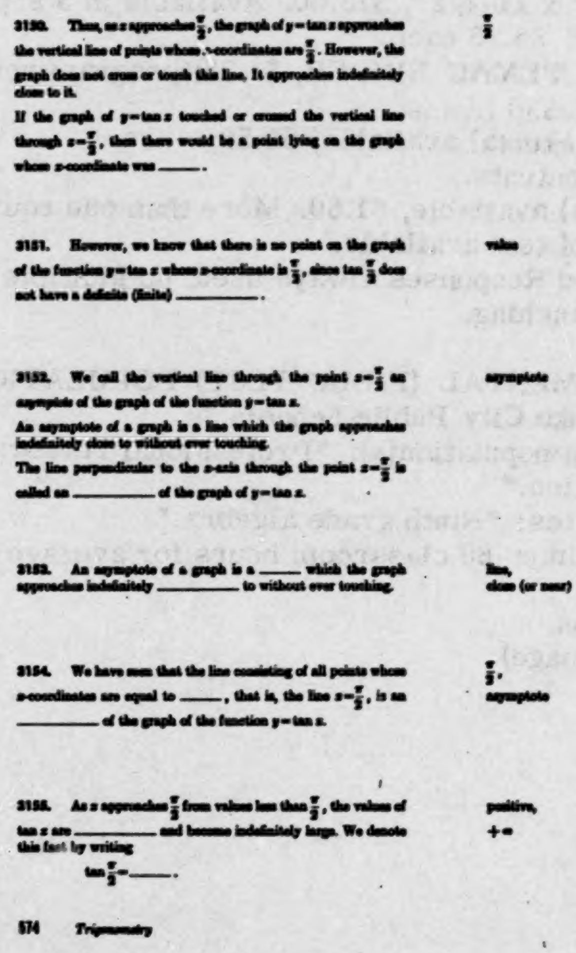
TRIGONOMETRY (PLANE)
DAVID L. LUCKHAM, Research Assistant, Massachusetts Institute of Technology
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 4,900 frames, paperback, 835 pp., 8-1/2" x 11-1/2", $13.00. Available in 3 separate units @ $5.25 each.
For use in TEMAC BINDER, $1.25; program reusable, $11.75.
Teacher's Manual available, $2.50.
Table of Contents.
Unit Test(s) available, $1.60. More than one equivalent form of test available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Roanoke City Public Schools."
Other using population(s): "Professional review; adult education."
Prerequisites: "Ninth grade algebra."
Average Time: 80 classroom hours for average students (est.).
No Revision.
(1 sample page)

MATHEMATICS-TRIGONOMETRY

TRIGONOMETRY (PLANE)
Luckham; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



3150. Thus, as x approaches $\frac{\pi}{2}$, the graph of $y = \tan x$ approaches the vertical line of points whose x-coordinates are $\frac{\pi}{2}$. However, the graph does not cross or touch this line. It approaches indefinitely close to it. If the graph of $y = \tan x$ touched or crossed the vertical line through $x = \frac{\pi}{2}$, then there would be a point lying on the graph whose x-coordinate was ______.	$\frac{\pi}{2}$
3151. However, we know that there is no point on the graph of the function $y = \tan x$ whose x-coordinate is $\frac{\pi}{2}$, since $\tan \frac{\pi}{2}$ does not have a definite (finite) __________.	value
3152. We call the vertical line through the point $x = \frac{\pi}{2}$ an asymptote of the graph of the function $y = \tan x$. An asymptote of a graph is a line which the graph approaches indefinitely close to without ever touching. The line perpendicular to the x-axis through the point $x = \frac{\pi}{2}$ is called an __________ of the graph of $y = \tan x$.	asymptote
3153. An asymptote of a graph is a ______ which the graph approaches indefinitely __________ to without ever touching.	line, close (or near)
3154. We have seen that the line consisting of all points whose x-coordinates are equal to ______, that is, the line $x = \frac{\pi}{2}$, is an __________ of the graph of the function $y = \tan x$.	$\frac{\pi}{2}$, asymptote
3155. As x approaches $\frac{\pi}{2}$ from values less than $\frac{\pi}{2}$, the values of $\tan x$ are __________ and become indefinitely large. We denote this fact by writing $\tan \frac{\pi}{2} =$ ______.	positive, $+\infty$

574 *Trigonometry*

DIABETES CONTROL (FOR DOCTORS)
MIRIAM SIERRA-FRANCO, U.S.I. Educational Science Division
DR. ARTHUR KROSNICK, Coordinator, Diabetes Control Program, N. J. Dept. of Health
Published by EDUCATIONAL SCIENCE DIVISION., U.S. INDUSTRIES, Inc.
250 Park Avenue, New York, New York

For use in AUTOTUTOR MARK II, $1,250; program reusable, 330 frames, $______.
Table of Contents.
Unit Test(s) available.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: MD degree.
Average Time: 3-6 hours (est.).
Next Revision: Not scheduled.
(1 sample page)

MEDICINE

DIABETES CONTROL (FOR DOCTORS)
Sierra-Franco, Krasnick; EDUCATIONAL SCIENCE
DIVISION, U.S. INDUSTRIES
one sample page:

Sample from Diabetes Control

11

In the last half of the nineteenth century, Claude Bernard defined the renal threshold for glucose. This threshold is the blood level above which glucose is excreted in the urine. (Urine normally contains a small quantity of glucose and other sugars.)

Bernard showed that glucose is excreted in the urine either when the renal threshold is too low (renal glycosuria) or when the concentration of glucose in the blood is too high. This research led to Bernard Naunyn's recognition that the glycosuria which is a sign of diabetes mellitus results from hyperglycemia.

The glycosuria which occurs as the result of a lowered renal threshold is found in a rare abnormality involving renal tubules. In this defect, patients have normal or low blood glucose concentrations, but the tubules fail to reabsorb glucose normally.

In this first part of our discussion, we are skimming through basic knowledge of the nature of diabetes mellitus and of relevant normal processes. So, now let us try to define the condition.

Of the alternatives shown below, which best completes the following definition of diabetes mellitus? Select the alternative you think is correct, and then push the button beside the answer you have chosen.

Diabetes mellitus is a disturbance of carbohydrate metabolism characterized by glycosuria due to:

Excretion of too much glucose in the urine. Ⓒ

Excessive glucose in the blood. Ⓑ

A low renal threshold for glucose. Ⓐ

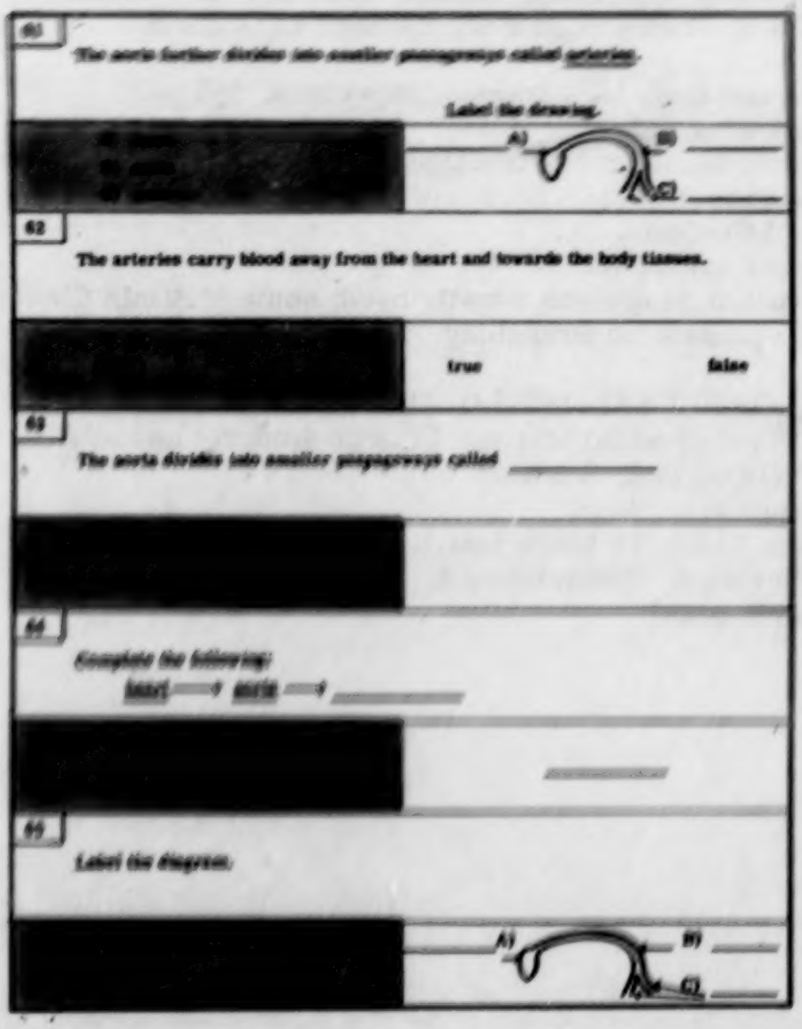
MEDICAL PHYSIOLOGY FOR THE HOME
TOM TRUJILLO, Programer, General Programmed
Teaching Corporation
SHIRLEY B. BITTERLICH, Editor, General Programmed
Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1800 frames, paperback, 385 pp.,
8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in the preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental testing: College students and adults.
Field testing: Adults."
Prerequisites: None.
Average Time: 18 hours (est.).
Next Revision: Undetermined.
(1 sample page)

MEDICINE

MEDICAL PHYSIOLOGY FOR THE HOME
Trujillo, Bitterlich; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



61

The aorta further divides into smaller passageways called arteries.

Label the drawing.

[redacted]

A) ______ B) ______ C) ______

62

The arteries carry blood away from the heart and towards the body tissues.

[redacted]

true false

63

The aorta divides into smaller passageways called ______

[redacted]

64

Complete the following:

heart → aorta → ______

[redacted]

______

65

Label the diagram.

[redacted]

A) ______ B) ______ C) ______

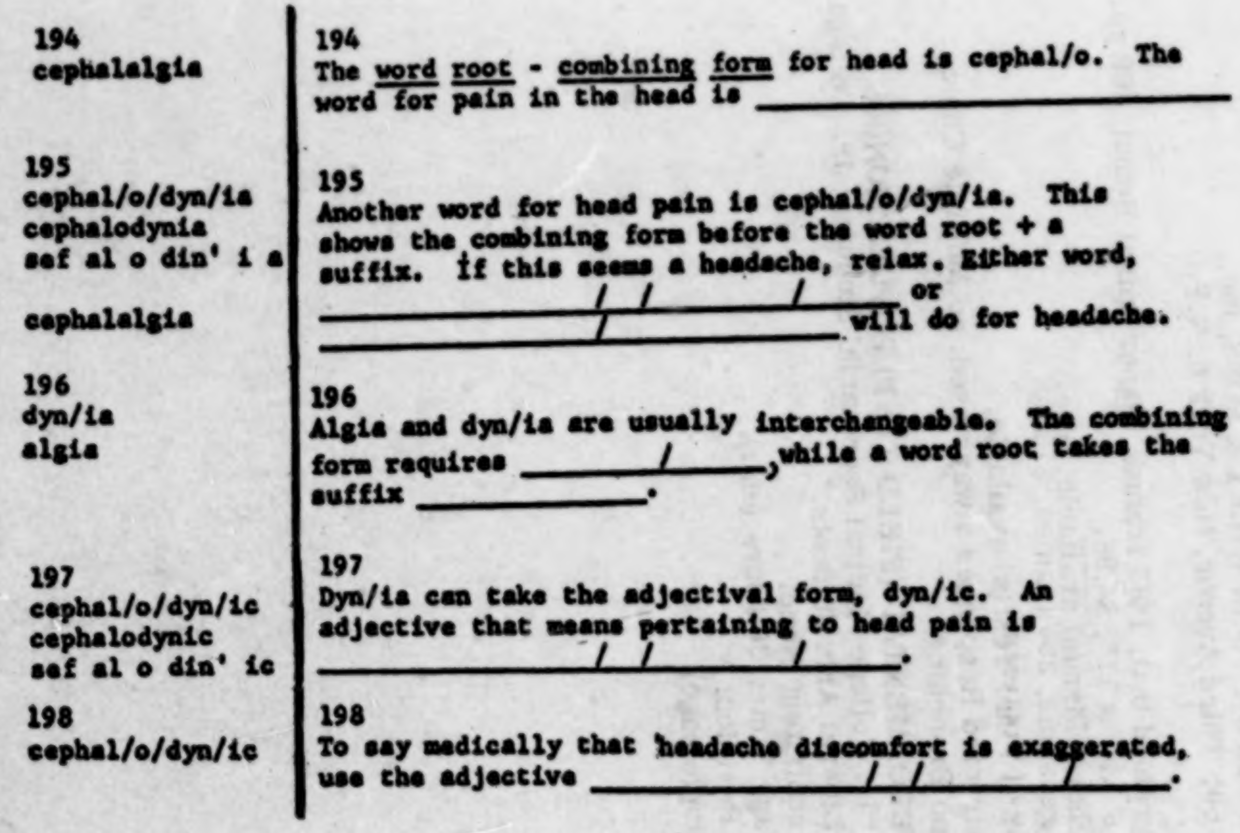
MEDICINE Tech. Ed.

MEDICAL TERMINOLOGY
A Programmed Textbook
GENEVIEVE LOVE SMITH
PHYLLIS E. DAVIS, both of Point Park Jr. College.
Published by: JOHN WILEY & SONS, Inc.,
605 Third Avenue, New York 6, N.Y.

Programed text, 1483 frames, Paper Spiral Bound, 300 pp., 8 1/2" x 11", $4.95.
Teacher's Manual available, free.
Index.
Unit and Final Test(s) available.
Constructed Responses always used; no Multiple Choice; no Branching.
DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Jr. College Medical Secretarial Students; Jr. College Liberal Arts Students."
Prerequisites: None.
Average Time: 30 hours (est.).
Next Revision:
(1 sample page)

MEDICINE

MEDICAL TERMINOLOGY
Smith, Davis; JOHN WILEY & SONS
one sample page:



194 cephalalgia	194 The word root - combining form for head is cephal/o. The word for pain in the head is ______________________
195 cephal/o/dyn/ia cephalodynia sef al o din' i a cephalalgia	195 Another word for head pain is cephal/o/dyn/ia. This shows the combining form before the word root + a suffix. If this seems a headache, relax. Either word, _____________/_/_______/_______ or _____________/________________ will do for headache.
196 dyn/ia algia	196 Algia and dyn/ia are usually interchangeable. The combining form requires ______/______, while a word root takes the suffix ___________.
197 cephal/o/dyn/ic cephalodynic sef al o din' ic	197 Dyn/ia can take the adjectival form, dyn/ic. An adjective that means pertaining to head pain is _____________/_/_______/_______.
198 cephal/o/dyn/ic	198 To say medically that headache discomfort is exaggerated, use the adjective ____________/_/_______/_______.

MEDICINE Adult

TAKING CARE OF DIABETES

MIRIAM SIERRA-FRANCO, U.S.I. Educational Science Division
DR. ARTHUR KROSNICK, Coordinator, Diabetes Control Program, N. J. Dept. of Health
Published by EDUCATIONAL SCIENCE DIVISION,
U.S. INDUSTRIES, Inc.
250 Park Avenue, New York, New York

For use in AUTOTUTOR MARK II, $1,250; program reusable, 205 frames, $70.00.
Table of Contents.
Unit Test(s) available.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
106 diabetics at Boston (Mass.) treatment centers.
Prerequisites: Diabetes
Average Time: 2-5 hours (est.).
Next Revision: Late 1963.
(1 sample page)

MEDICINE

TAKING CARE OF DIABETES
Sierra-Franco, Krosnick; EDUCATIONAL SCIENCE
DIVISION, U.S. INDUSTRIES
one sample page:

Sample from Taking Care of Diabetes

18

YOUR ANSWER: Carbohydrate is a source of body fuel.

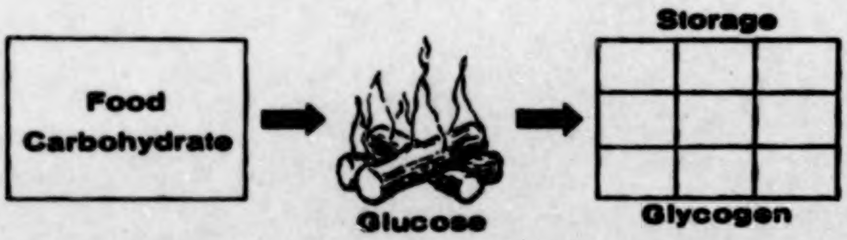
You are correct.

The foods we eat also contain protein, fat, minerals, vitamins, and water. Carbohydrate is a part of the food the body uses for fuel.

Cars use fuel just as it comes from the pump. But the body can't do this. The body has to change carbohydrate into a different form before it can use it.

The body changes carbohydrate into a form called glucose. Then it can use this glucose right away for energy and warmth.

If the body wants to store fuel for future use, it then changes the glucose into a form called glycogen. It stores the glycogen in the liver and other body tissues.



Remember the words "glucose" and "glycogen" and what they mean. Now choose the right answer.

The body uses glucose:

To make carbohydrate. Ⓑ

For fuel. Ⓐ

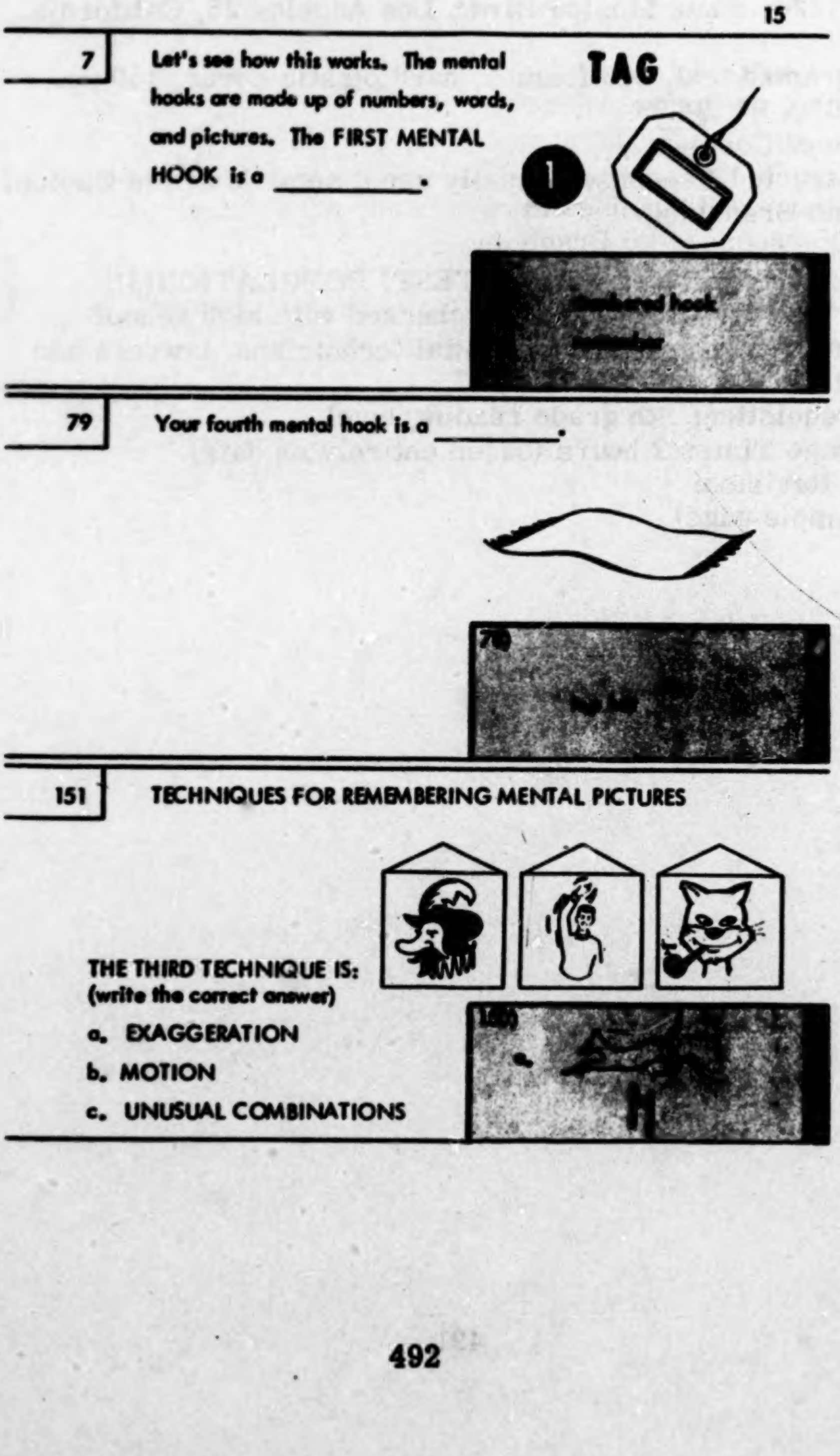
BASIC MEMORY TRAINING
STANLEY L. LEVINE, Vice President, Training Systems, Inc.
Published by TRAINING SYSTEMS, Inc.,
12248 Santa Monica Blvd., Los Angeles 25, California.

Programed text, 216 frames, hard plastic cover, 150 pp., 6" x 9", $4.95
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"This program has been checked with high school students, housewives, dental technicians, lawyers and two company presidents."
Prerequisites: 8th grade reading level.
Average Time: 2 hours (based entirely on data).
Next Revision:
(1 sample page)

MISCELLANEOUS

BASIC MEMORY TRAINING
Levine; TRAINING SYSTEMS
one sample page:



15

7 Let's see how this works. The mental hooks are made up of numbers, words, and pictures. The FIRST MENTAL HOOK is a ______.

[illegible]bered hook
[illegible]

79 Your fourth mental hook is a ______.

78 [illegible]

151 TECHNIQUES FOR REMEMBERING MENTAL PICTURES

THE THIRD TECHNIQUE IS:
(write the correct answer)
a. EXAGGERATION
b. MOTION
c. UNUSUAL COMBINATIONS

150 [illegible]

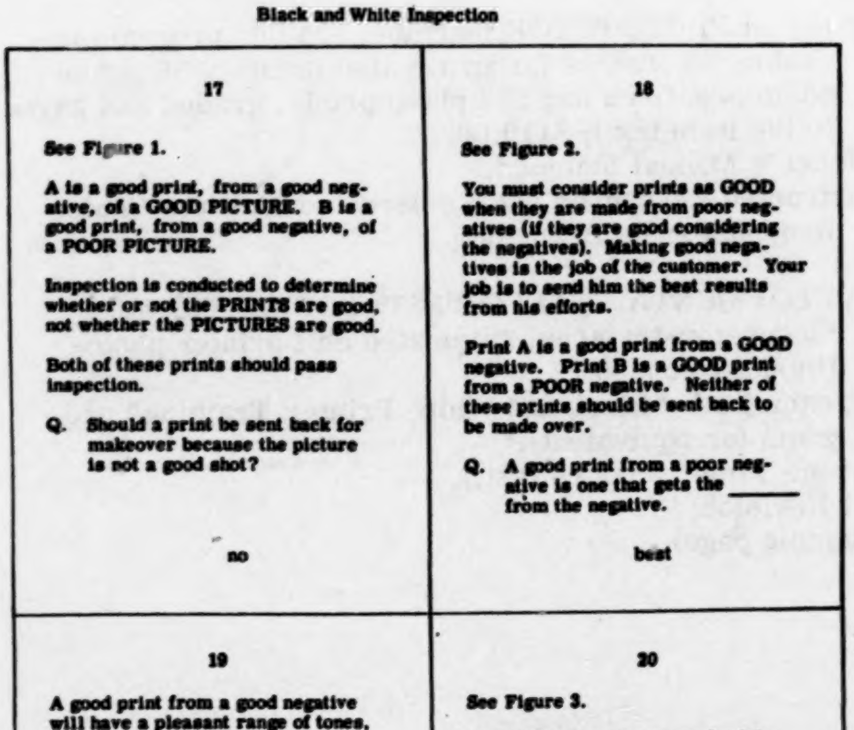
BLACK AND WHITE INSPECTION
ART CUNNINGHAM, Hamilton Research Associates.
Published by HAMILTON RESEARCH ASSOCIATES, Inc., Seneca Turnpike, New Hartford, N. Y.

For use in PHOTOTUTOR machine, $75.00; program reusable, 64 frames (program also includes 36 actual photo negatives and 122 photo prints, graded and keyed to the item text), $110.00.
Teacher's Manual included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Inspector-trainees, automated cell printer photofinishing houses."
Prerequisites: "Black and White Printer Training" program (or equivalent)."
Average Time: 2 hours (est.).
Next Revision:
(1 sample page)

MISCELLANEOUS

BLACK AND WHITE INSPECTION
Cunningham; HAMILTON RESEARCH ASSOCIATES
one sample page:



Black and White Inspection

17

See Figure 1.

A is a good print, from a good negative, of a GOOD PICTURE. B is a good print, from a good negative, of a POOR PICTURE.

Inspection is conducted to determine whether or not the PRINTS are good, not whether the PICTURES are good.

Both of these prints should pass inspection.

Q. Should a print be sent back for makeover because the picture is not a good shot?

no

18

See Figure 2.

You must consider prints as GOOD when they are made from poor negatives (if they are good considering the negatives). Making good negatives is the job of the customer. Your job is to send him the best results from his efforts.

Print A is a good print from a GOOD negative. Print B is a GOOD print from a POOR negative. Neither of these prints should be sent back to be made over.

Q. A good print from a poor negative is one that gets the ______ from the negative.

best

19

A good print from a good negative will have a pleasant range of tones, from blacks to whites, without joining any of them.

Q. Good prints from good negatives have pleasant ________ of __________.

range, tones

20

See Figure 3.

All of these prints are good prints from good negatives. Note that all of them have a nice range of tones from black to white.

Q. A good print______(has, does not have) a nice range of tones.

has

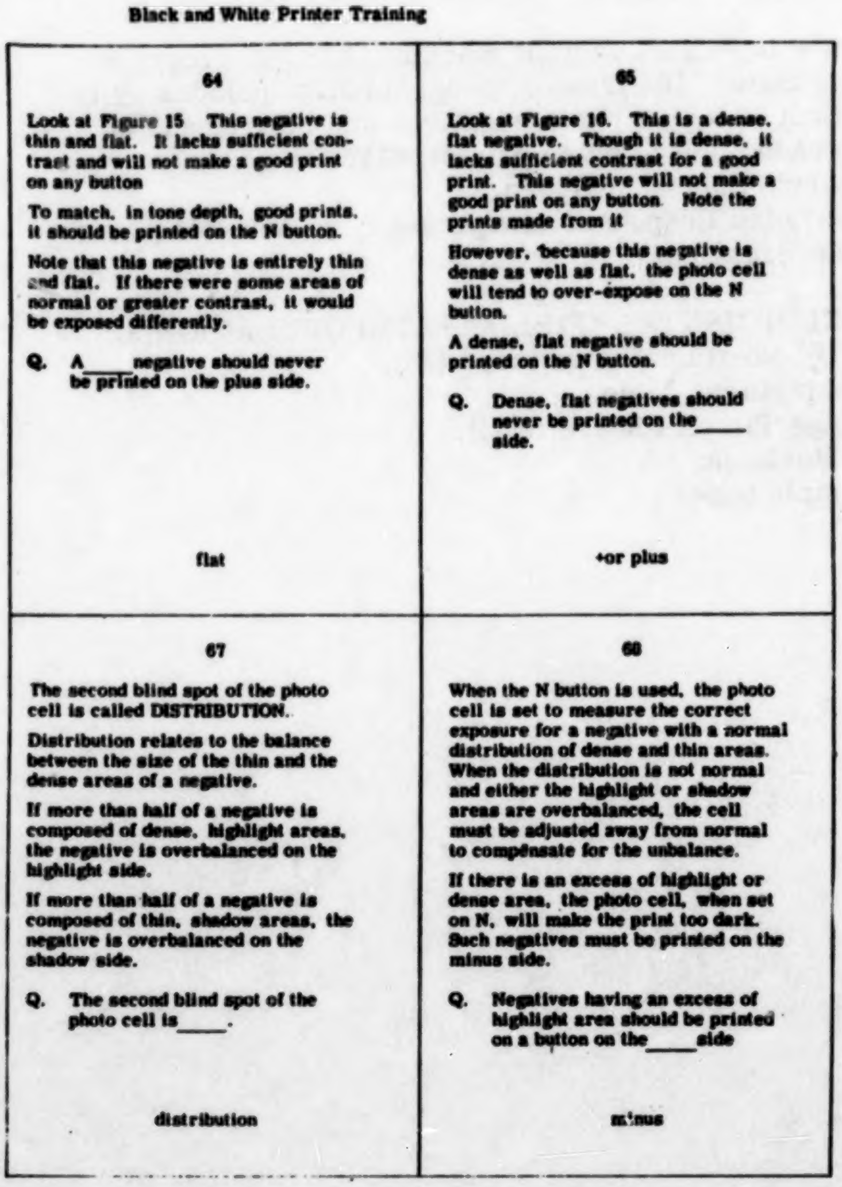
BLACK AND WHITE PRINTER TRAINING PROGRAM
ART CUNNINGHAM, Hamilton Research Associates.
Published by HAMILTON RESEARCH ASSOCIATES, Inc., Seneca Turnpike, New Hartford, N. Y.

For use in PHOTOTUTOR machine, $75.00; program reusable, 104 frames (program also includes more than 50 actual photo negatives and more than 100 graded, keyed photo prints), $175.00.
Teacher's Manual included.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Photo-finishing trainees (25)."
Prerequisites: None
Average Time: 4 hours (est.).
Next Revision:
(1 sample page)

MISCELLANEOUS

BLACK AND WHITE PRINTER TRAINING PROGRAM
Cunningham; HAMILTON RESEARCH ASSOCIATES
one sample page:



Black and White Printer Training

64 Look at Figure 15 This negative is thin and flat. It lacks sufficient contrast and will not make a good print on any button To match, in tone depth, good prints, it should be printed on the N button. Note that this negative is entirely thin and flat. If there were some areas of normal or greater contrast, it would be exposed differently. Q. A_____negative should never be printed on the plus side. flat	65 Look at Figure 16. This is a dense, flat negative. Though it is dense, it lacks sufficient contrast for a good print. This negative will not make a good print on any button Note the prints made from it However, because this negative is dense as well as flat, the photo cell will tend to over-expose on the N button. A dense, flat negative should be printed on the N button. Q. Dense, flat negatives should never be printed on the_____ side. +or plus
67 The second blind spot of the photo cell is called DISTRIBUTION. Distribution relates to the balance between the size of the thin and the dense areas of a negative. If more than half of a negative is composed of dense, highlight areas, the negative is overbalanced on the highlight side. If more than half of a negative is composed of thin, shadow areas, the negative is overbalanced on the shadow side. Q. The second blind spot of the photo cell is_____. distribution	68 When the N button is used, the photo cell is set to measure the correct exposure for a negative with a normal distribution of dense and thin areas. When the distribution is not normal and either the highlight or shadow areas are overbalanced, the cell must be adjusted away from normal to compensate for the unbalance. If there is an excess of highlight or dense area, the photo cell, when set on N, will make the print too dark. Such negatives must be printed on the minus side. Q. Negatives having an excess of highlight area should be printed on a button on the_____side minus

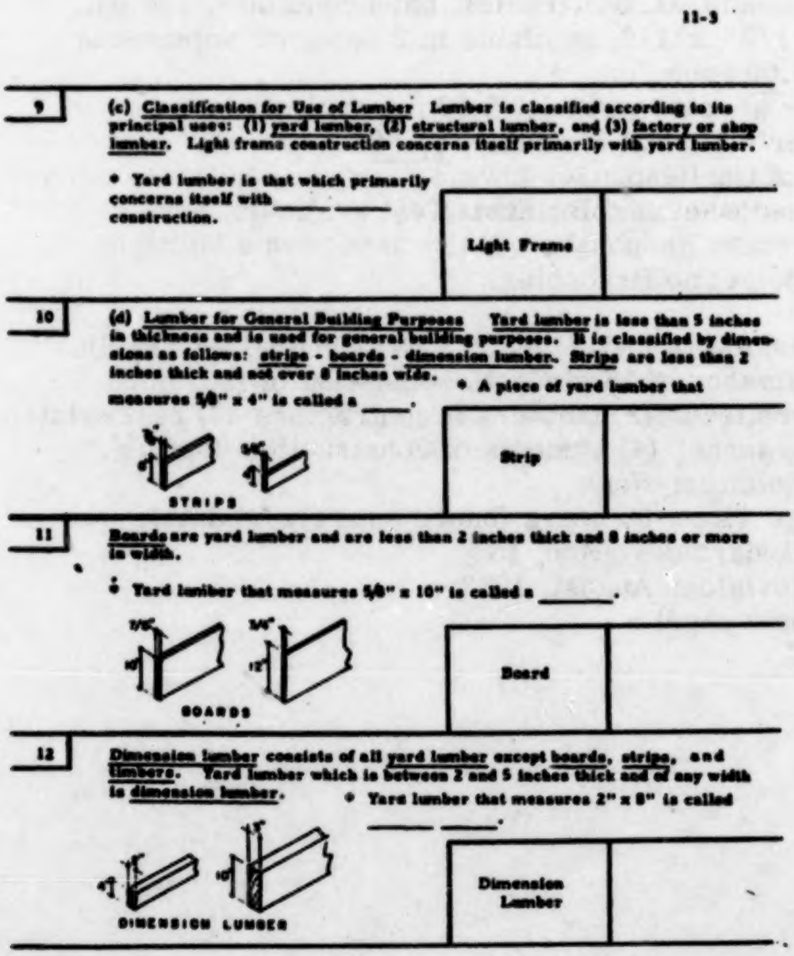
BUILDING MATERIALS & METHODS OF CONSTRUCTION
WILLIAM J. HORNUNG, Teacher, Construction Technology
Published by HORNUNG-SON PUBLICATIONS COMPANY,
82 Wenwood Drive, Massapequa Park, L. I., N.Y.

Programed text, 511 frames, hard container, 160 pp., 8 1/2" x 11", available in 2 separate volumes at $5.00 each.
Answer sheets available, $.50 for each student.
Teacher's Manual available, $3.50.
Table of Contents.
Unit Test(s) available; Final Test available, $.50.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Classes of 25 students consisting of (1) future architects (2) builders & contractors (3) real estate personnel (4) students of construction drafting."
Prerequisites: None
Average Time: 30 hours (based entirely on data); standard deviation, 15%.
Next Revision: August, 1963.
(1 sample page)

MISCELLANEOUS

BUILDING MATERIALS & METHODS OF CONSTRUCTION
Hornung; HORNUNG-SON PUBLICATIONS COMPANY
one sample page:



11-3

9

(c) Classification for Use of Lumber Lumber is classified according to its principal uses: (1) yard lumber, (2) structural lumber, and (3) factory or shop lumber. Light frame construction concerns itself primarily with yard lumber.

• Yard lumber is that which primarily concerns itself with _____ _____ construction.

Light Frame

10

(d) Lumber for General Building Purposes Yard lumber is less than 5 inches in thickness and is used for general building purposes. It is classified by dimensions as follows: strips - boards - dimension lumber. Strips are less than 2 inches thick and not over 8 inches wide.

• A piece of yard lumber that measures 5/8" x 4" is called a _____.

STRIPS

Strip

11

Boards are yard lumber and are less than 2 inches thick and 8 inches or more in width.

• Yard lumber that measures 5/8" x 10" is called a ________.

BOARDS

Board

12

Dimension lumber consists of all yard lumber except boards, strips, and timbers. Yard lumber which is between 2 and 5 inches thick and of any width is dimension lumber.

• Yard lumber that measures 2" x 8" is called _____ _____.

DIMENSION LUMBER

Dimension Lumber

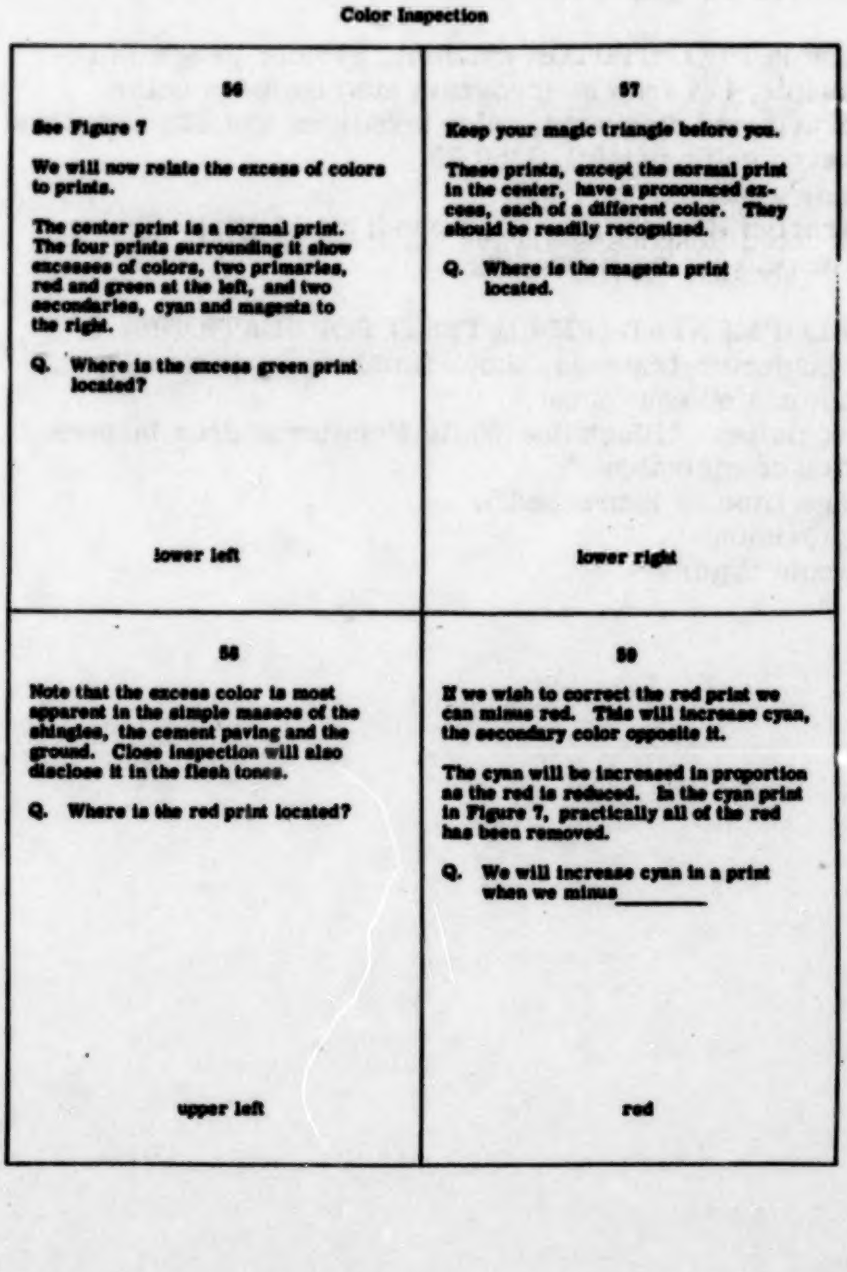
COLOR INSPECTION
ART CUNNINGHAM, Hamilton Research Associates.
Published by HAMILTON RESEARCH ASSOCIATES, Inc.,
Seneca Turnpike, New Hartford, N. Y.

For use in PHOTOTUTOR machine, $75.00; program reusable, 124 frames (program also includes color charts and diagrams, color negatives and 82 graded and keyed color prints), $350.00.
Teacher's Manual included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Inspector-trainees, photo-finishing houses using automated equipment."
Prerequisites: "Black and White Printing and/or inspection of equivalent."
Average time: 5 hours (est.).
Next Revision:
(1 sample page)

MISCELLANEOUS

COLOR INSPECTION
Cunningham; HAMILTON RESEARCH ASSOCIATES
one sample page:



Color Inspection

56 See Figure 7 We will now relate the excess of colors to prints. The center print is a normal print. The four prints surrounding it show excesses of colors, two primaries, red and green at the left, and two secondaries, cyan and magenta to the right. Q. Where is the excess green print located? lower left	57 Keep your magic triangle before you. These prints, except the normal print in the center, have a pronounced excess, each of a different color. They should be readily recognized. Q. Where is the magenta print located. lower right
58 Note that the excess color is most apparent in the simple masses of the shingles, the cement paving and the ground. Close inspection will also disclose it in the flesh tones. Q. Where is the red print located? upper left	59 If we wish to correct the red print we can minus red. This will increase cyan, the secondary color opposite it. The cyan will be increased in proportion as the red is reduced. In the cyan print in Figure 7, practically all of the red has been removed. Q. We will increase cyan in a print when we minus________ red

MISCELLANEOUS Coll.-Adult

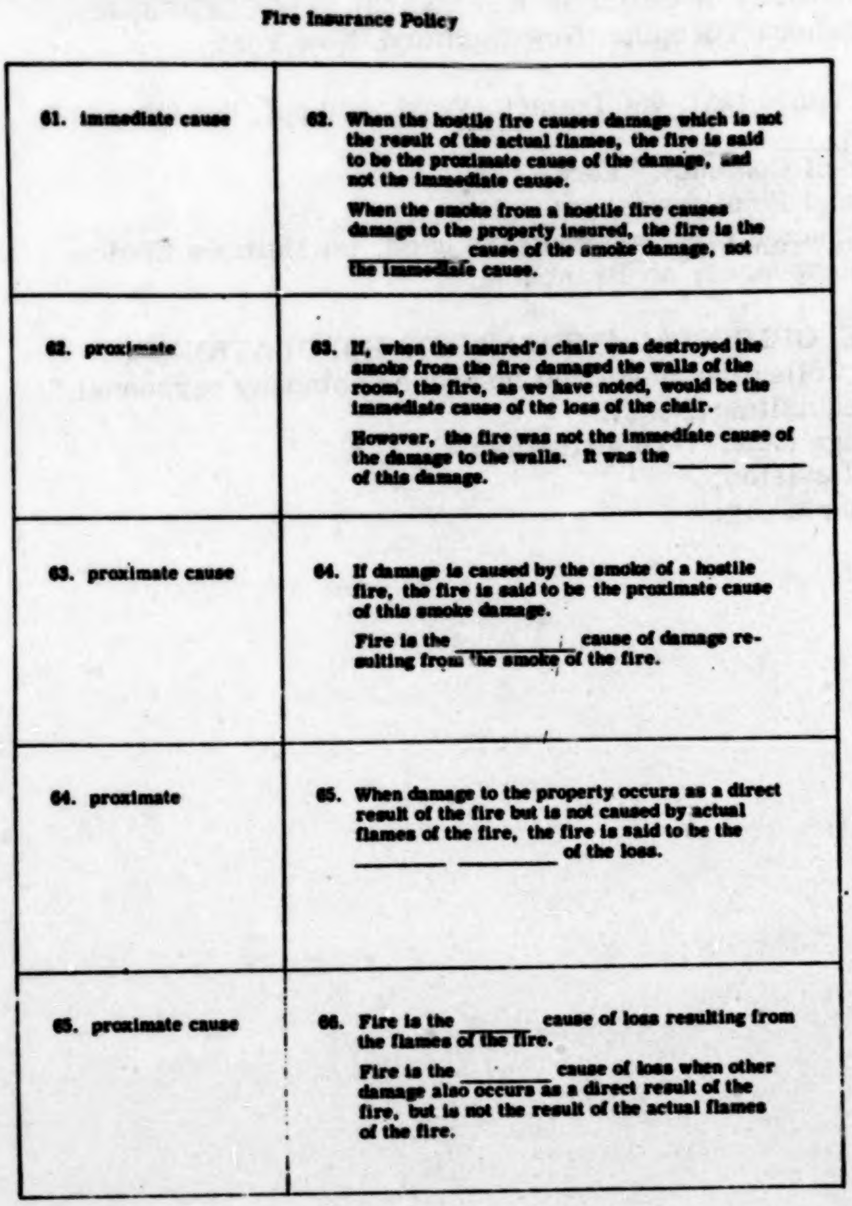
FIRE INSURANCE POLICY
JOHN R. FONSECA, Director of Educational Programs,
Hamilton Research Associates.
Published by HAMILTON RESEARCH ASSOCIATES, Inc.,
Seneca Turnpike, New Hartford, New York

Programed text, 650 frames, Vinyl, 100 pp., 8-1/2" x 11",
$____.
Table of Contents, Index.
Unit and Final test(s) available.
Constructed Responses always used; no Multiple Choice
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"College students and insurance company personnel."
Prerequisites: None.
Average time: 7-10 hours (est.).
Next Revision:
(1 sample page)

MISCELLANEOUS

FIRE INSURANCE POLICY
Fonesca; HAMILTON RESEARCH ASSOCIATES
one sample page:



Fire Insurance Policy

61. immediate cause	62. When the hostile fire causes damage which is not the result of the actual flames, the fire is said to be the proximate cause of the damage, and not the immediate cause. When the smoke from a hostile fire causes damage to the property insured, the fire is the ________ cause of the smoke damage, not the immediate cause.
62. proximate	63. If, when the insured's chair was destroyed the smoke from the fire damaged the walls of the room, the fire, as we have noted, would be the immediate cause of the loss of the chair. However, the fire was not the immediate cause of the damage to the walls. It was the _____ _____ of this damage.
63. proximate cause	64. If damage is caused by the smoke of a hostile fire, the fire is said to be the proximate cause of this smoke damage. Fire is the __________ cause of damage resulting from the smoke of the fire.
64. proximate	65. When damage to the property occurs as a direct result of the fire but is not caused by actual flames of the fire, the fire is said to be the ________ ________ of the loss.
65. proximate cause	66. Fire is the ________ cause of loss resulting from the flames of the fire. Fire is the ________ cause of loss when other damage also occurs as a direct result of the fire, but is not the result of the actual flames of the fire.

THE 24-HOUR CLOCK
and Time Computations
JEANNE VANG. LUCY., Programer, Hamilton Research Associates.
Published by HAMILTON RESEARCH ASSOCIATES, Inc., Seneca Turnpike, New Hartford, N. Y.

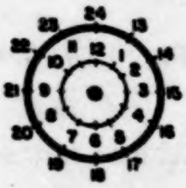
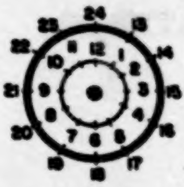
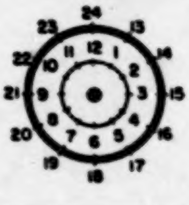
Programed text, 78 frames, paperback, 80 pp., 3" x 5" cards; $1.50.
Final test available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"High School students (25)."
Prerequisites: None
Average time: 1 hour (est.).
Next Revision:
(1 sample page)

MISCELLANEOUS

THE 24-HOUR CLOCK
Lucy; HAMILTON RESEARCH ASSOCIATES
one sample frame:

24-Hour Clock and Time Computations

 24 13 14 15 16 17 18 19 20 21 22 23 12 1 2 3 4 5 6 7 8 9 10 11	26 The numbers in the inner circle tell the time from midnight until noon and the outer circle tells the time from ______ to ______	noon midnight
 24 13 14 15 16 17 18 19 20 21 22 23 12 1 2 3 4 5 6 7 8 9 10 11	27 You can see that 4 p. m. is the same as 1600 and 10 p. m. is the same as ______.	2200
 24 13 14 15 16 17 18 19 20 21 22 23 12 1 2 3 4 5 6 7 8 9 10 11	28 The minute hand works the same for both clocks 9:24 a. m. is the same as 0924, and 2:19 p. m. is the same ____. 3:15 p. m. is written ____ in 24-hour time.	1419 1515
	29 An easy way to change p. m. time to 24-hour time is to add 1200 to the p. m. time. 1:10 p. m. in the 24-hour time becomes 110 + 1200 or ______.	1310
	30 4:40 p. m. is written ______ in 24-hour time, and is spoken ______-______-______.	1640 sixteen-forty-hours

HOW TO FOLLOW THE STOCK MARKET
JANE BOYD LARIMORE, Programer, Learning, Inc.
W. G. BECKER, Prof. of Finance, Arizona State University.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona

Programed text, 167 frames, paperback, 53 pp. 8-1/2" x 11", $2.20.
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching

DEVELOPMENTAL (FIELD TEST) POPULATION(S): Adults.
Other Using Population(s): High school students.
Prerequisites:
Average Time: 2 hours (est.).
Next Revision: "The program is the final revision."
(1 sample page)

MISCELLANEOUS

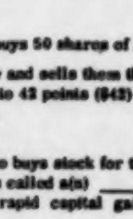
HOW TO FOLLOW THE STOCK MARKET
Larimore, Becker; LEARNING INCORPORATED
one sample page:

1-7

But before you contact a stock broker, you should decide what type of stock buyer you are going to be and what kind of ________ you want to buy.	stock
1-8 You could be one of two types of stock buyers: a speculator or an investor. Speculators speculate and investors ________ .	invest

••••••••••••••••••••

1-16



A speculator is not particularly interested in holding a stock long enough to receive dividend. He hopes to make a quick profit by selling stock at a ________ price than he paid.	higher (greater)
1-17 A man who buys 50 shares of stock at $38\frac{1}{2}$ points ($38.50) per share and sells them the following week when they have gone up to 42 points ($42) would be called a(n) ________ .	speculator
1-18 A person who buys stock for the purpose of having a dividend income is called a(n) ________ . A person who is interested in rapid capital gain is called a(n) ________ .	investor; speculator

MISCELLANEOUS H.S.

HOW TO MEASURE BOARD FEET
PAK DONALD PUBLISHING CO. STAFF
Published by PAK DONALD PUBLISHING Company, Inc., Stayton, Oregon.

Programed text, 100 frames, loose leaf, 60 pp., 4 1/4" x 9 1/2", $1.50, individual edition; $3.50, classroom edition.
Answer Sheets included.
Teacher's Manual included.
Final and Diagnostic Test(s) included.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

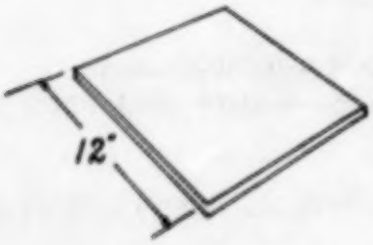
Prerequisites:
Additional material required: 3 ring binder to hold program.
Average Time: 1/2-1 hour (est.).
Next Revision: Whenever necessary.
(1 sample page)

MISCELLANEOUS

HOW TO MEASURE BOARD FEET
PakDonald Publishing Co. Staff; PAK DONALD PUBLISHING
one sample page:

3q

Here's the same board.



How wide is it -- in inches?

---

2 32a

37q

And at this point you may have some objections.

"Suppose," we can hear you say, "the thickness and width of the board is not given in inches? Suppose it's given in feet?"

Well, it isn't. Thickness is **always** given in inches. So is width. But length is nearly always given in feet.

But it was a good question. So good, as a matter of fact, we can't think of one to ask you. Just turn the page.

HOW TO READ THE OFFICIAL AIRLINE GUIDE
Quick Reference Edition
ROBERT R. PRENTIS
JEANNE VANG. LUCY
NANCY SIMMONS, all of Hamilton Research Associates.
Published by: HAMILTON RESEARCH ASSOCIATES, Inc.,
Seneca Turnpike, New Hartford, N. Y.

Programed Text, 450 frames, loose leaf, 500 pp., 3" x 5" cards, $____.
Unit and Final Test(s) available.
Constructed Responses always used; no Multiple Choice; no Branching.

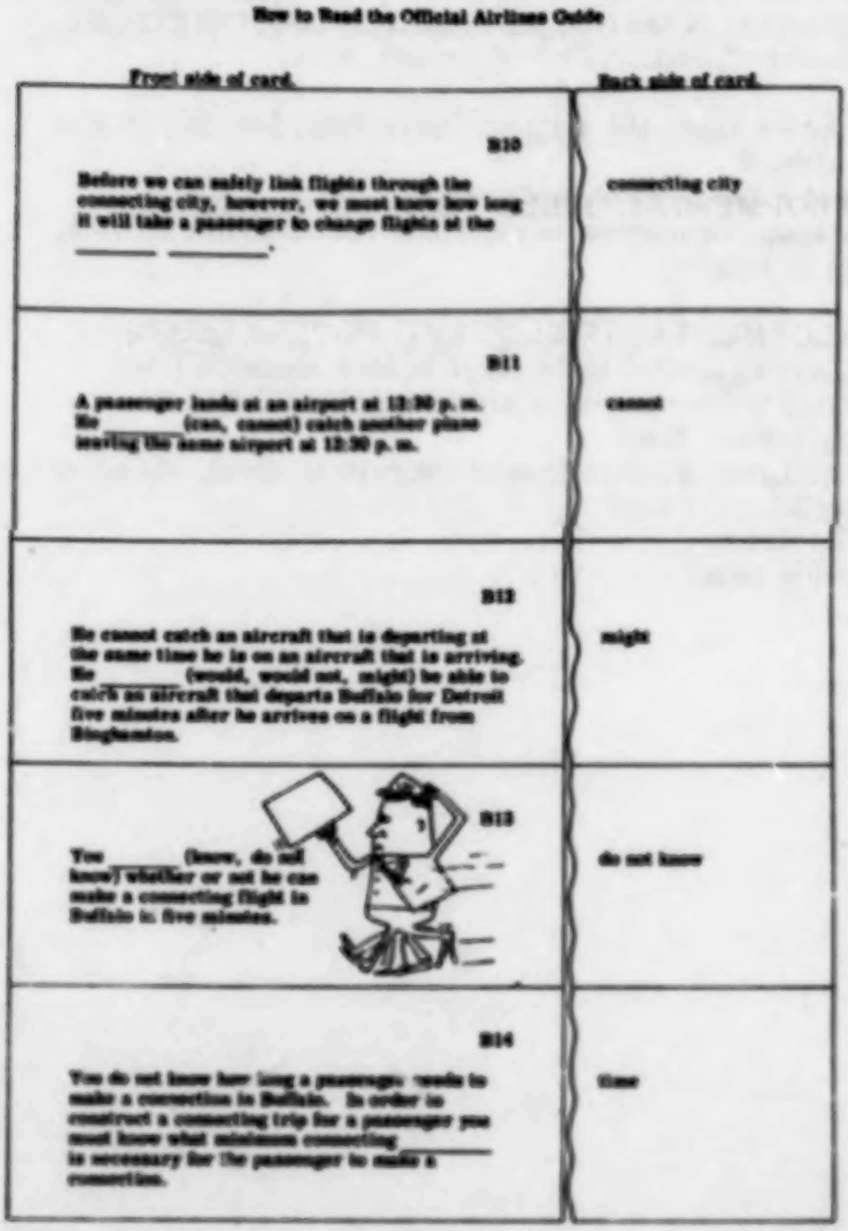
DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental tests—high school students (15), Field tests—new-hire airline personnel (60)."
Prerequisites: None
Average time: 5 hours (based entirely on data); standard deviation, 1 hour.
Next Revision:
(1 sample page)

MISCELLANEOUS

HOW TO READ THE OFFICIAL AIRLINE GUIDE

Prentis, Lucy, Simmons; HAMILTON RESEARCH ASSOCIATES

one sample page:



How to Read the Official Airlines Guide

Front side of card.	Back side of card.
B10 Before we can safely link flights through the connecting city, however, we must know how long it will take a passenger to change flights at the ______ ______.	connecting city
B11 A passenger lands at an airport at 12:30 p. m. He ______ (can, cannot) catch another plane leaving the same airport at 12:30 p. m.	cannot
B12 He cannot catch an aircraft that is departing at the same time he is on an aircraft that is arriving. He ______ (would, would not, might) be able to catch an aircraft that departs Buffalo for Detroit five minutes after he arrives on a flight from Binghamton.	might
B13 You ______ (know, do not know) whether or not he can make a connecting flight in Buffalo in five minutes.	do not know
B14 You do not know how long a passenger needs to make a connection in Buffalo. In order to construct a connecting trip for a passenger you must know what minimum connecting ______ is necessary for the passenger to make a connection.	time

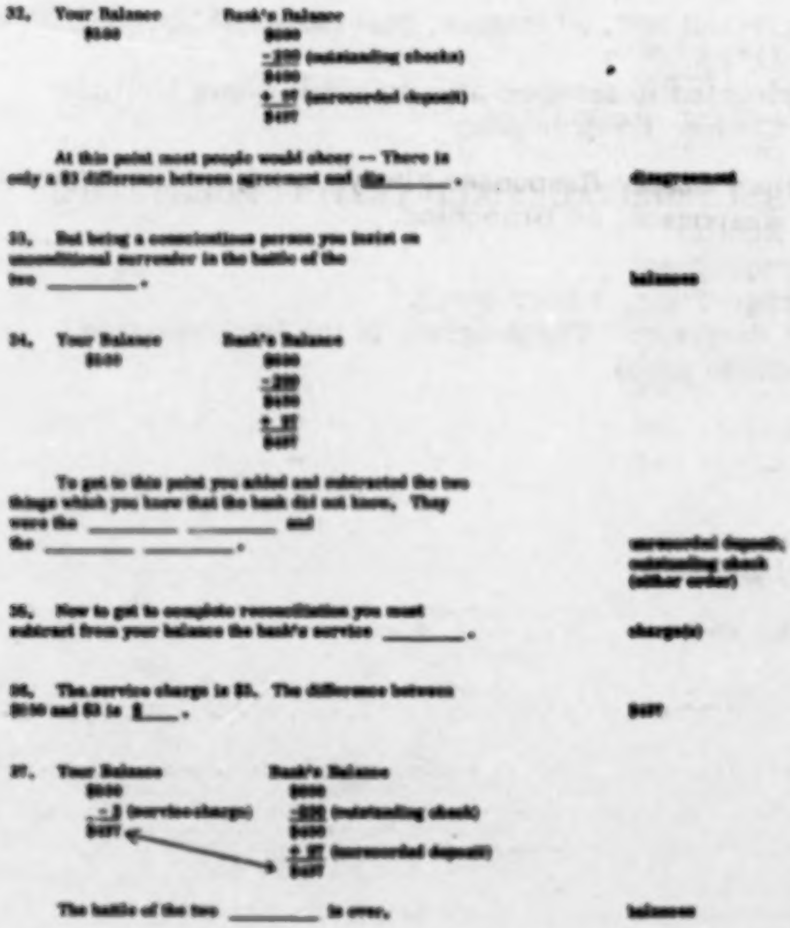
HOW TO GET ALONG WITH YOUR BANK STATEMENT
JANE BOYD LARIMORE, Programer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 50 frames, paperback, 13 pp., 8-1/2" x 11", $.60
Constructed Responses usually used; some Multiple Choice; no Branching

DEVELOPMENTAL (FIELD TEST) POPULATION(S): Adults.
Prerequisites:
Average Time: 1 hour (est.).
Next Revision: "The program is the final revision."
(1 sample page)

MISCELLANEOUS

HOW TO GET ALONG WITH YOUR BANK STATEMENT
Larimore; LEARNING INCORPORATED
one sample page:



32. Your Balance $500 Bank's Balance $600
-200 (outstanding checks)
$400
+ 97 (unrecorded deposit)
$497

At this point most people would cheer -- There is only a $3 difference between agreement and dis_______.

disagreement

33. But being a conscientious person you insist on unconditional surrender in the battle of the two _______.

balances

34. Your Balance $500 Bank's Balance $600
-200
$400
+ 97
$497

To get to this point you added and subtracted the two things which you knew that the bank did not know. They were the _______ _______ and the _______ _______.

unrecorded deposit,
outstanding check
(either order)

35. Now to get to complete reconciliation you must subtract from your balance the bank's service _______.

charge(s)

36. The service charge is $3. The difference between $500 and $3 is $___.

$497

37. Your Balance $500
- 3 (service charge)
$497
Bank's Balance $600
-200 (outstanding check)
$400
+ 97 (unrecorded deposit)
$497

The battle of the two _______ is over.

balances

MISCELLANEOUS H.S. +

HOW TO BE MORE CREATIVE

LAURENCE WHISLER, Consultant in Programed Education, Central Scientific Co.

Published by CENTRAL SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

Programed text, over 200 problem frames, 34 pp., 8-1/2" x 11", $____.

Planned for use in CENCO PROGRAMED LEARNER, $2.95; program included in price of machine.

Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Planned population of 100."

Prerequisites:

Average Time: 3 hours (est.).

Next Revision: "Estimated date of availability: September."

(1 sample page)

MISCELLANEOUS

HOW TO BE MORE CREATIVE
Whisler; CENTRAL SCIENTIFIC
one sample page:

HOW TO BE MORE CREATIVE
RULES FOR CREATIVE THINKING

IN BRIEF: The three rules for creative thinking are: Get and keep the inititiative (in thought and action); alternate factual and imaginative thinking; practice, to define rules and to correct weaknesses.

. . . .

169 1/2 Creation results from personal speculative venture. Creation is a personal enterprise made where there is no possible guarantee of success. With or without reason, the creative individual believes that he controls his own fate.

. . . .

170. The detective with a continuing record of solving crimes is certain to be an individual who is creative, and individual who takes the initiative. The detective hears many reports about the crime. He does not accept as final the reports that he hears. The good detective expects to hear a good deal of "nonsense" about the crime. From the very first he has his own hypotheses or ____________ about the cause of the crime.

a) conclusions b) facts c) hunches

. . . .

MISCELLANEOUS H.S.

HOW TO REMEMBER FACES AND NAMES
A Practical Application of Psychology
B. JAMES SPEROFF, Applied Psychology, Roosevelt University
Published by LEARNING FOUNDATIONS INSTITUTE, Inc., 271 North Avenue, New Rochelle, N.Y.

For use in the MINIK machine, $14.95; program reusable; 210 frames, $1.00.
Constructed Responses usually used; some Multiple Choice Responses and Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

Prerequisites:
Average Time: 2 hours (est.).
Next Revision
(1 sample page)

MISCELLANEOUS

HOW TO REMEMBER FACES AND NAMES
Speroff; LEARNING FOUNDATIONS INSTITUTE
one sample page:

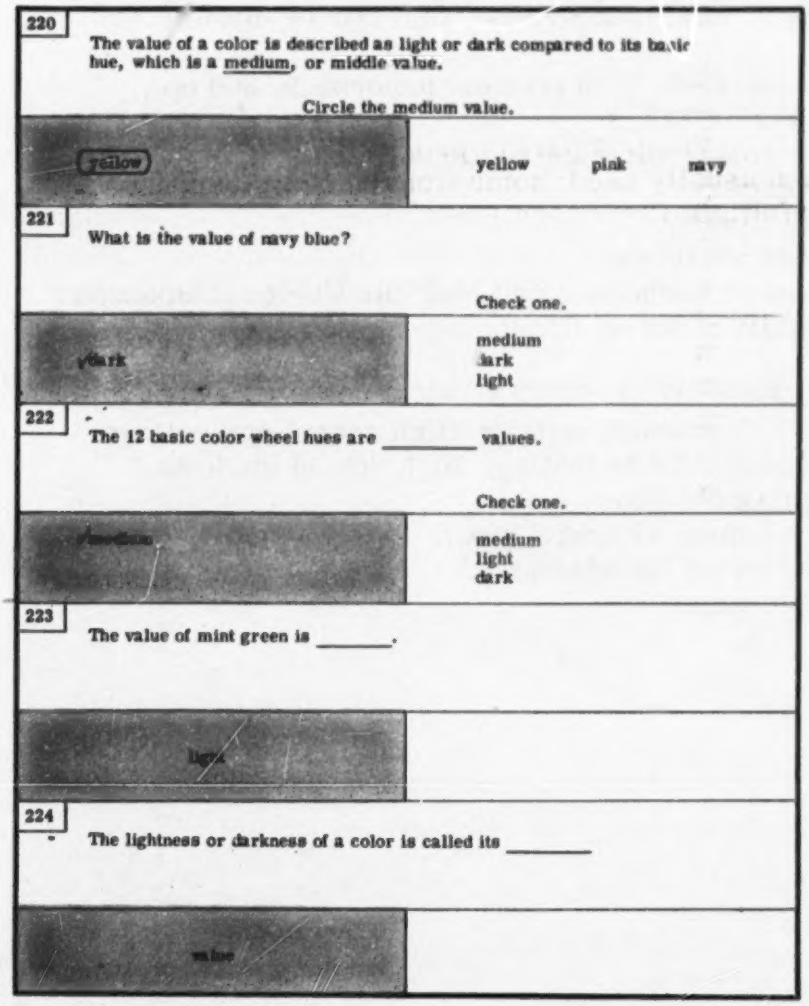
INTERIOR DECORATION
MARCIA B. PAZEL, Programer, GPTC
JAMES F. RUDDLE, Editor, GPTC
EDNA M. MORGAN, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois.

Programed text, 1800 frames, paperback, 360 pp., 8-1/2" x 11", $_____.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses and Multiple Choice Responses usually used; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: High school and college students. Field testing: High school students."
Prerequisites: None.
Average Time: 19 hours (est.).
Next Revision: Undetermined.
(1 sample page)

MISCELLANEOUS

INTERIOR DECORATION
Pazel, Ruddle, Morgan; ENCYCLOPAEDIA BRITTANICA PRESS
one sample page:



220

The value of a color is described as light or dark compared to its basic hue, which is a medium, or middle value.

Circle the medium value.

yellow

yellow pink navy

221

What is the value of navy blue?

Check one.

✓dark

medium
dark
light

222

The 12 basic color wheel hues are ________ values.

Check one.

✓medium

medium
light
dark

223

The value of mint green is _______.

light

224

The lightness or darkness of a color is called its ________

value

MISCELLANEOUS Elem.-Adult

LEARNING THE DIALOGUE MASS, FOR CHILDREN,
ADULTS AND MASS SERVERS
Latin (No. 14-19-02)
MEL THERRIEN, Teacher, St. Paul Public Schools
Published by ELECTRONIC TEACHING LABORATORIES,
5034 Wisconsin Avenue, N.W., Washington 16, D.C.

For use in TAPE RECORDER, program reusable,
260 frames, $23.95.
Unit test(s), "integral part of program."
Repetition usually used; some Constructed Responses;
no Multiple Choice; no Branching.
DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: "Most useful to Roman Catholics."
Additional material required: Minimum requirement:
tape recorder, missal; tape recorder, $160.00.
Average Time: 20 hours (est.).
Next Revision: "Awaiting results of Vatican Conferences
(Ecumenical Council)."
(1 sample page)

MISCELLANEOUS

LEARNING THE DIALOGUE MASS, FOR CHILDREN, ADULTS AND MASS SERVERS
Therrien; ELECTRONIC TEACHING LABORATORIES
one sample page:

SAMPLE FRAMES Learning the Dialogue Mass

1.	CUE (Priest)	Domine, exaudi orationem meum.
	RESPONSE	(timed pause for student response)
	MASTER	Et clamor meus ad te veniat.
	↕	
	REINFORCEMENT	(timed pause for repetition)
2.	CUE (Priest)	Dominus vobiscum.
	RESPONSE	(timed pause for student response)
	MASTER	Et cum spiritu tuo.
	↕	
	REINFORCEMENT	(Timed pause for repetition)
	PRIEST	Oremus.

Item withdrawn by
agreement with the
compiler, at the
contractor's expense.

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MISCELLANEOUS H.S.-Adult

PRACTICAL LAW
A Course in Everyday Contracts
WARREN LEHMAN, U.S.I. Educational Science Division
Published by DOUBLEDAY & COMPANY, Inc.,
575 Madison Avenue, New York, New York

Programed text, 377 frames, hard cover, 406 pp.,
8-1/4" x 5-3/8", $4.95.
Table of Contents, Index.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: High school education.
Average Time: 6-8 hours (est.).
Next Revision: "Not scheduled."
(1 sample page)

MISCELLANEOUS

PRACTICAL LAW
Lehman; DOUBLEDAY & COMPANY
one sample page:

Sample from Practical Law

19
(from page 22)

YOUR ANSWER: The court would say that certain warranties about the milk were implied in the sales contract and would proceed to consider your case on its merits.

Correct. The law assumes that there are implied warranties applicable to the sales contracts entered verbally every day. Among the implied warranties listed in the Uniform Sales Act, adopted by most states, are the following:

The seller is the true owner or his agent and has the legal right to dispose of the goods.

If sale follows the inspection of a sample, the bulk will conform to the sample.

Goods sold by description -- that is, without the purchaser having the opportunity to examine them -- will conform to the description and be of average quality.

Goods sold with the seller's knowledge that they are to be used for a specific purpose will be fit for that purpose, e.g., fit for human consumption in the case of food.

Goods will be delivered within a reasonable time.

The words of a contract, unless the subject is highly technical, will be interpreted according to common usage.

Those doing business or providing services are also responsible for the safety of their customers. For instance, in those states that will not consider fitness an implied warranty in the purchase of food in a restaurant, the person who is given tainted food has recourse to the charge that the restaurant was negligent in its responsibility for his safety.

Now let's suppose that the milkman surprises you by answering your note with two quarts of fresh, wholesome goat's milk.

There would be legal basis for complaint. page 23

There would be no legal basis for complaint. page 26

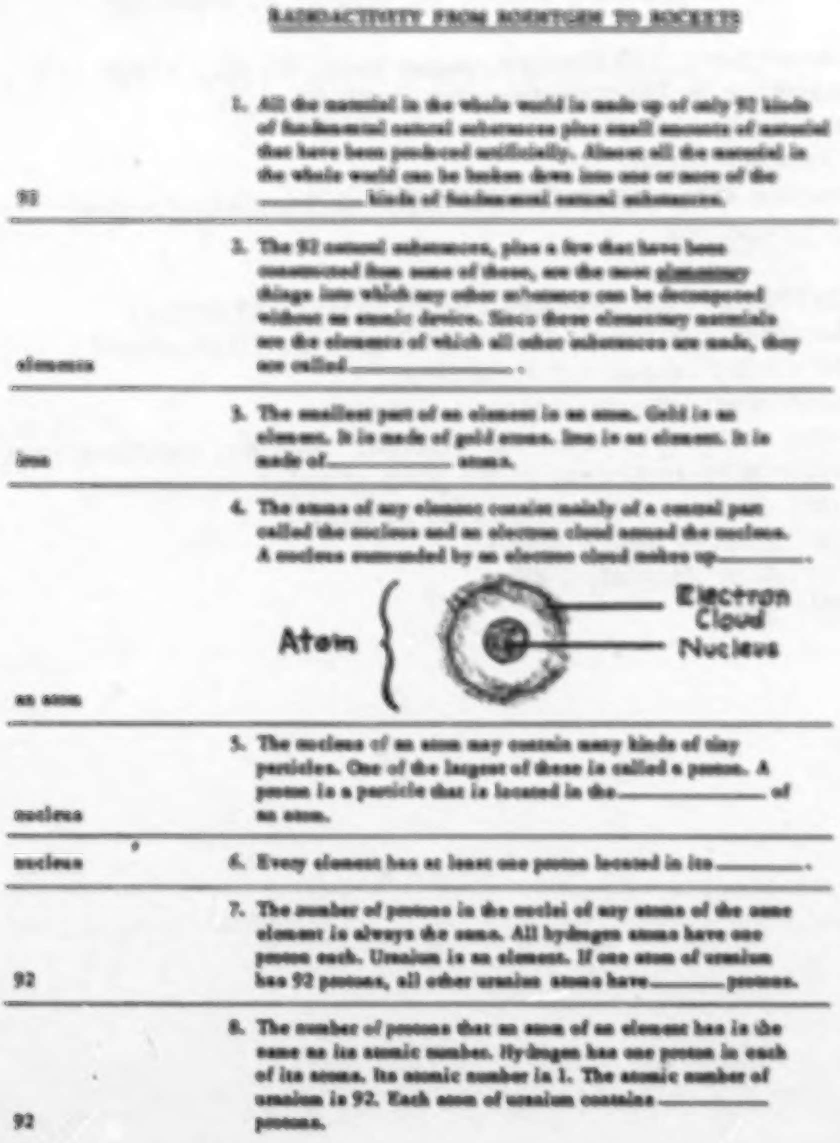
RADIOACTIVITY FROM ROENTGEN TO ROCKETS
Fallout Protection
MARSHALL ARKY, et al., Roto-Vue
Published by MODEL PUBLISHING Company,
1602-08 Hodiamont Street, St. Louis 12, Missouri

Programed text, 500 frames, paperback, 60 pp., 7"x10 1/2", available in 2 separate units at $2.50 each.
Answer Sheets included.
Final Test available.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Selected individuals for development. High school and adult classes for field test."
Prerequisites: General science course.
Additional material required: "Geiger counter, electroscope, radioactive isotopes, some photographic equipment, cloud chamber, etc. would be helpful."
Average Time: 4 hours (est.).
Next Revision: August, 1963.
(1 sample page)

MISCELLANEOUS

RADIOACTIVITY FROM ROENTGEN TO ROCKETS
Arky; MODEL PUBLISHING
one sample page:



RADIOACTIVITY FROM ROENTGEN TO ROCKETS

92	1. All the material in the whole world is made up of only 92 kinds of fundamental natural substances plus small amounts of material that have been produced artificially. Almost all the material in the whole world can be broken down into one or more of the ______ kinds of fundamental natural substances.
elements	2. The 92 natural substances, plus a few that have been constructed from some of these, are the most elementary things into which any other substance can be decomposed without an atomic device. Since these elementary materials are the elements of which all other substances are made, they are called ______ .
iron	3. The smallest part of an element is an atom. Gold is an element. It is made of gold atoms. Iron is an element. It is made of ______ atoms.
an atom	4. The atoms of any element consist mainly of a central part called the nucleus and an electron cloud around the nucleus. A nucleus surrounded by an electron cloud makes up ______.
nucleus	5. The nucleus of an atom may contain many kinds of tiny particles. One of the largest of these is called a proton. A proton is a particle that is located in the ______ of an atom.
nucleus	6. Every element has at least one proton located in its ______.
92	7. The number of protons in the nuclei of any atoms of the same element is always the same. All hydrogen atoms have one proton each. Uranium is an element. If one atom of uranium has 92 protons, all other uranium atoms have ______ protons.
92	8. The number of protons that an atom of an element has is the same as its atomic number. Hydrogen has one proton in each of its atoms. Its atomic number is 1. The atomic number of uranium is 92. Each atom of uranium contains ______ protons.

YOUR LIFE INSURANCE
BARBARA H. HATHAWAY, J.S.I. Educational Science Division.
Published by DOUBLEDAY & CO., Inc.,
575 Madison Avenue, N.Y.C.

Programed text, 383 frames, hard cover, 413 pp.,
8 1/4" x 5 3/8", $5.95.
Table of Contents, Index.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: High school education.
Average Time: 6-8 hours (est.).
Next Revision: "Dependent on publisher requirements."
(1 sample page)

MISCELLANEOUS

YOUR LIFE INSURANCE
Hathaway; DOUBLEDAY & CO.
one sample page:

Sample from *Your Life Insurance*

6
(from page 1)

PERSONAL VS. PROPERTY INSURANCE

As early as 900 B.C., many merchants contributed a little to make up the value of the loss faced by one trader when his ship was wrecked. They shared the risk.

Risk sharing is the basis of insurance. To insure against loss or damage is to guarantee that values will be safeguarded in case certain unfortunate events occur.

This is accomplished today by means of a contract between a single party and an *insurer*, who promises to pay a fixed sum in the event that the contributor suffers a specified loss or damage.

(We call an insurance contract a *policy* — from the Italian word "polizza," meaning a promise or understanding.)

In the beginning, the merchandise merited more concern than the mariners. But, gradually, insurance contracts were written on persons as well as property. Human life became valuable, too.

Insurance is still divided into two parts — property and personal.

> When you take out *property* insurance, you are insuring against the loss or damage of *something that belongs to you.*
>
> When you take out *personal* insurance, you are insuring against the loss or disability of *you.*

Here's a problem that will clarify the difference.

You accidentally step on a girl's sandal-clad foot in a crowded bus, breaking her toe. The insurance you carry to pay for the damage falls into which of these two categories? (Pick your answer, then turn to the appropriate page.)

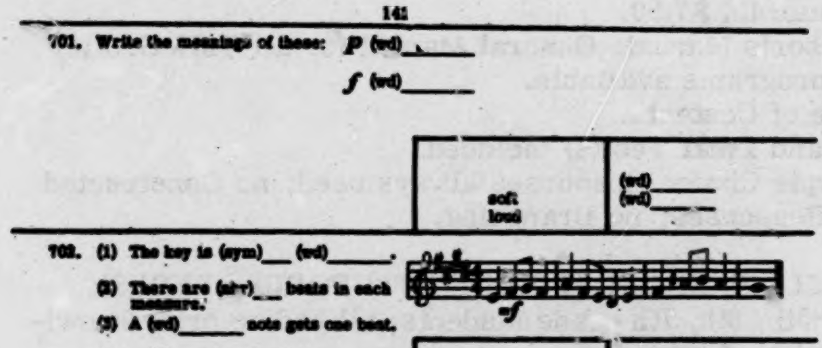
Property insurance.	page 10
Personal insurance.	page 15

FUNDAMENTALS OF MUSIC
LLOYD E. HOMME
DONALD T. TOSTI, both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION, 575 Lexington Avenue, New York 22, N.Y.
Programed text, 895 frames, paperback, 201 pp., 8-1/2" x 11", $8.50.
For use in MIN/MAX II machine, $25.00; program reusable, $7.50.
Teacher's Manual: General Manual for all TMI-Grolier programs available.
Table of Contents.
Unit and Final Test(s) included.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S);
"5th, 6th, 7th grade students; all had no prior knowledge of subject."
Prerequisites:
Average Time: 6-8 hours (based entirely on data); standard deviation, .262 hours.
Next Revision: March, 1964.
(1 sample page)

MUSIC

FUNDAMENTALS OF MUSIC
Homme; Tosti; TEACHING MATERIALS CORPORATION
one sample page:



141

701. Write the meanings of these: *p* (wd)______

f (wd)______

soft
loud

(wd)______
(wd)______

702. (1) The key is (sym)___ (wd)______.

(2) There are (abr)___ beats in each measure.

(3) A (wd)______ note gets one beat.

(4) *mf* means (WDS)______ ______.

(1) E major
(2) 4
(3) quarter
(4) medium loud

(1) (sym)___ (wd)______
(2) (abr)___
(3) (wd)______
(4) (WDS)______ ______

703. 1. Which measure has an error in it? (abr)___

2. How many sixteenth notes are there in the music? (abr)___

3. What key is this in? (sym)__ (wd)______

4. How many beats does the dot in the last measure get? (abr)___

1. (2)
2. 10
3. G major
4. 1

704. 1. What key is this in? (sym)___ (wd)______

2. How many beats are in each measure? (abr)___

3. What does *mf* mean? (WDS)______ ______

4. What kind of note gets one beat? (wd)______

1. F major
2. 6
3. medium loud
4. eighth

705. 1. What kind of rest does the second measure have? (wd)______

2. Name the flats in the key signature. (syms)

3. This clef is called the (wd)______ clef.

4. What does *p* mean? (wd)______

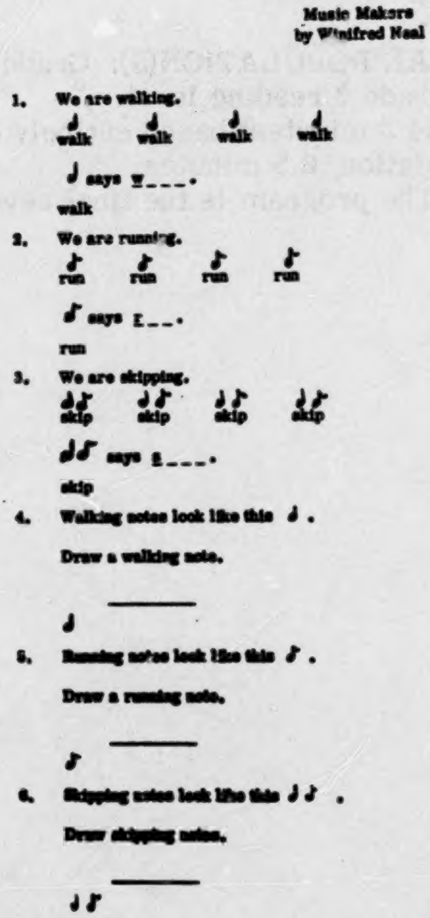
1. quarter
2. B E A D
3. treble
4. soft

MUSIC MAKERS
WINIFRED NEAL, Programer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 33 frames, $.15.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL POPULATION(S): Grade 3.
Prerequisites: Grade 3 reading level.
Average Time: 24.2 minutes (based entirely on data); standard deviation, 6.5 minutes.
Next Revision: "The program is the final revision."
(1 sample page)

MUSIC MAKERS
Neal; LEARNING INCORPORATED
one sample page:



Music Makers
by Winifred Neal

1. We are walking.
♩ walk ♩ walk ♩ walk ♩ walk

♩ says w___.

walk

2. We are running.
♪ run ♪ run ♪ run ♪ run

♪ says r__.

run

3. We are skipping.
♩♪ skip ♩♪ skip ♩♪ skip ♩♪ skip

♩♪ says s___.

skip

4. Walking notes look like this ♩.

Draw a walking note.

____

♩

5. Running notes look like this ♪.

Draw a running note.

____

♪

6. Skipping notes look like this ♩♪.

Draw skipping notes.

____

♩♪

MUSIC EDUCATION Elem.-Adult Ed.

MUSICAL NOTATION
JOHN BATCHELLER, Author
BETTY LOU C. DUBOIS, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS,
425 N. Michigan Avenue, Chicago 11, Illinois

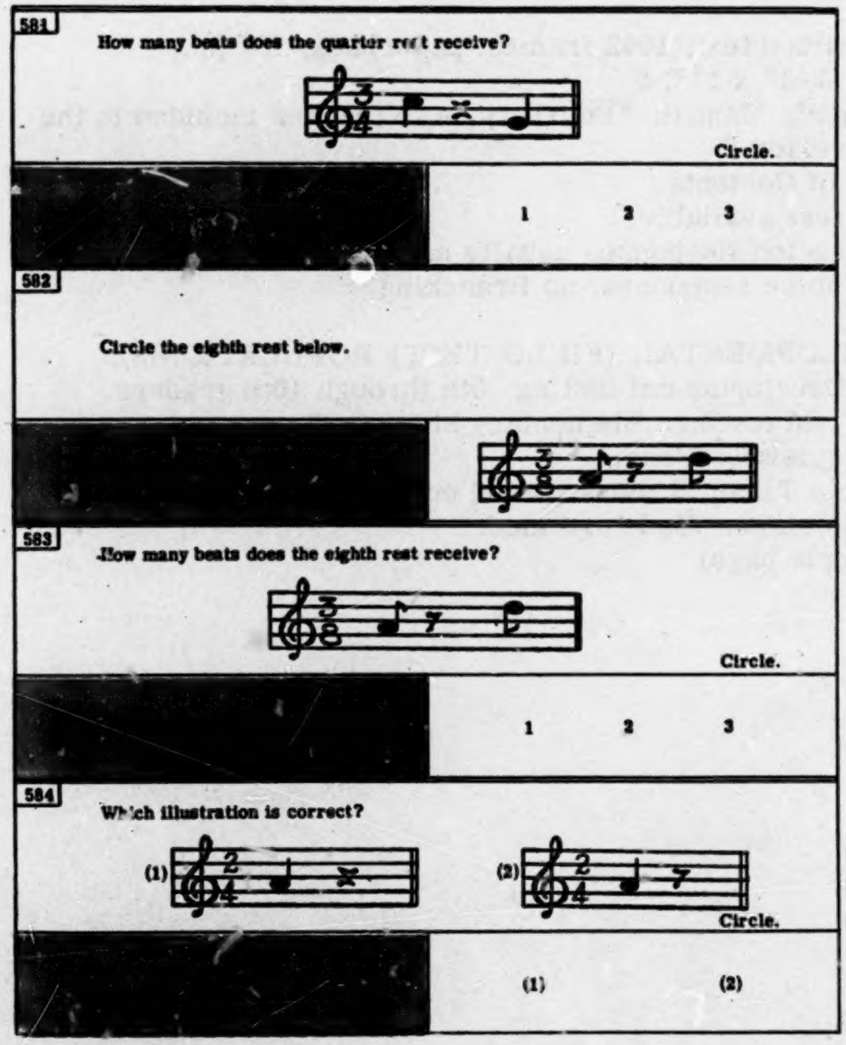
Programed text, 1042 frames, paperback, 131 pp., 8-1/2" x 11", $____.
Teacher's Manual: "Instructions to teacher included in the preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental testing: 5th through 10th graders.
Field testing: Elementary students."
Prerequisites: None.
Average Time: 6 hours (based entirely on data).
Next Revision: Undetermined.
(1 sample page)

MUSICAL NOTATION

Batcheller, Dubois; ENCYCLOPAEDIA BRITTANNICA PRESS

one sample page:



581 How many beats does the quarter rest receive?

Circle.

1 2 3

582 Circle the eighth rest below.

583 How many beats does the eighth rest receive?

Circle.

1 2 3

584 Which illustration is correct?

(1) (2)

Circle.

(1) (2)

APPLICATIONS OF PROGRAMED INSTRUCTION
TECHNICAL STAFF, General Education, Inc.
Published by GENERAL EDUCATION, Inc.,
96 Mt. Auburn Street, Cambridge 38, Mass.

For use in a MAIL-A-TUTOR, program reusable, 23 frames, machine and program, $.25.
Constructed Responses usually used, some Multiple Choice, no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Tested on members of General Education, Inc. Office staff."
Prerequisites: "Ability to read and smile."
Average Time: Three to five minutes (est.).
Next Revision: "None planned as yet."
(1 sample page)

APPLICATIONS OF PROGRAMED INSTRUCTION
Technical Staff; GENERAL EDUCATION

one sample page:

1. This is a teaching machine program. You can tell that it is a t_____ m_____ p_____ because it has blanks in it (like those you just "filled in"). (Now turn the knob.	teaching machine program (The correct answer appears here. Compare it with what you "filled in".)
2. When you "filled in" the blanks in the last item, you learned something. Whether or not you intended to, you learned that this funny little box contains . . . (just another advertising gimmick/a teaching machine program). (Choose one alternative and turn the knob.)	a teaching machine program
3. We may be prejudiced, but we'd say that the hottest thing in programed instruction is called General Education. G_____ _____, Inc., that is. That's our company.	General Education (Inc.)
5. General Education is located in Cambridge, Mass., in the center of Harvard-M.I.T. community. Obviously, consultants on any subject matter area are . . . (readily accesible/imported by camel train).	readily accessible
6. Don't forget: our name is . . . (General/Specific) Education, Inc., and we . . . (sell risque' postcards/ write teaching machine programs).	General; write teaching machine programs
8. Among Gen Ed's satisfied clients are the Harvard Business School, Monsanto Chemical Company, and Arthur Wiesenberger & Company, member firm of the New York and American Stock Exchanges.	No answer required

PROGRAMING H.S.+

EXPLAINING "TEACHING MACHINES" AND PROGRAMMING
DAVID CRAM, Audio-visual Dept., San Jose State College.
Published by FEARON PUBLISHERS, Inc.
828 Valencia Street, San Francisco 10, California

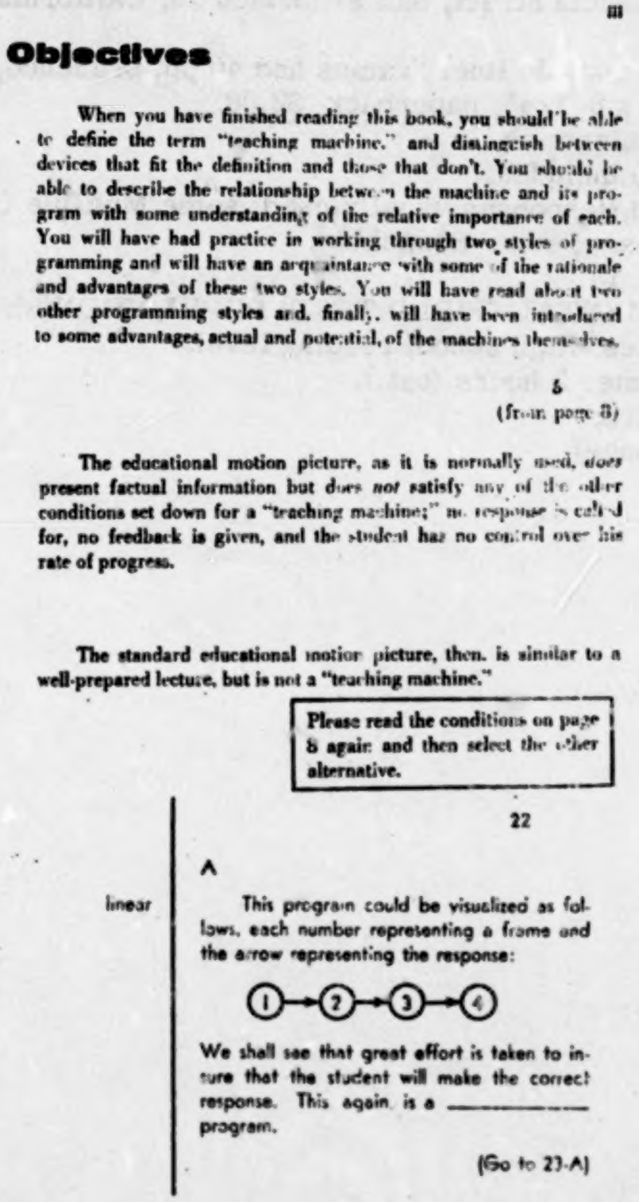
Programed text, 50 liner frames and 40 pp. branched, 5 1/2" x 8 1/4", paperback, $2.00.
Table of Contents.
Unit Test(s) included.
Constructed Responses usually used; some Multiple Choice Responses; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: High school reading level.
Average Time: 2 hours (est.).
Next Revision:
(1 sample page)

PROGRAMING

EXPLAINING "TEACHING MACHINES" AND PROGRAMMING

Cram; FEARON PUBLISHERS
one sample page:



iii

Objectives

When you have finished reading this book, you should be able to define the term "teaching machine," and distinguish between devices that fit the definition and those that don't. You should be able to describe the relationship between the machine and its program with some understanding of the relative importance of each. You will have had practice in working through two styles of programming and will have an acquaintance with some of the rationale and advantages of these two styles. You will have read about two other programming styles and, finally, will have been introduced to some advantages, actual and potential, of the machines themselves.

5
(from page 8)

The educational motion picture, as it is normally used, *does* present factual information but *does not* satisfy any of the other conditions set down for a "teaching machine;" no response is called for, no feedback is given, and the student has no control over his rate of progress.

The standard educational motion picture, then, is similar to a well-prepared lecture, but is not a "teaching machine."

Please read the conditions on page 8 again and then select the other alternative.

22

A

linear

This program could be visualized as follows, each number representing a frame and the arrow representing the response:

① → ② → ③ → ④

We shall see that great effort is taken to insure that the student will make the correct response. This again, is a __________ program.

(Go to 23-A)

A PROGRAMED GUIDE TO WRITING AUTO
INSTRUCTIONAL PROGRAMS
JAMES L. BECKER, RCA
Published by RCA EDUCATIONAL SERVICES,
RADIO CORPORATION OF AMERICA,
Camden 8, N. J.

Programed text, 1,200 frames, paperback, 150 pp.,
8 1/2" x 11", $6.50.
Table of Contents.
"Test consists of writing programs. Arrangements can be made with RCA for evaluation."
Constructed Responses usually used; some Multiple Choice Responses and Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Secondary school teachers and RCA seminar participants."
Prerequisites: "Some training experience. A general knowledge of what an auto instructional program is."
Additional equipment required: pencil and paper for writing frames.
Average Time: 24 hours (est.).
Next Revision: Undetermined.
(1 sample page)

A PROGRAMED GUIDE TO WRITING AUTO INSTRUCTIONAL PROGRAMS

Becker; RCA EDUCATIONAL SERVICES

one sample page:

Chapter 5

The Dynamics of a Frame

This chapter is presented in a vertical format. Using a blotter or a blank sheet of paper uncover a frame at a time; by moving the paper slightly further you will receive your confirmation.

1. If learning is defined as a change in behavior, teaching is an interaction with the student that effects this ____________________.

change in behavior

2. Teaching generally entails an __________ with the student.

interaction

3. In order for a program to teach effectively it must __________ with the student.

interact

4. The basic unit of a program is a frame. The f______ teaches by interacting with the student.

frame

5-1

PROGRAMING Open

PROGRAMMED INSTRUCTION
The Process
JAC D. MEACHAM, president, Graficroll Systems, Inc.
Published by GRAFICROLL SYSTEMS, INC.
4215 Calavo Drive, La Mesa, California.

Programed text, 110 frames, paperback, 120 pp.,
5 1/2" x 8", $2.95.
Table of Contents.
Final Test available.
Branching usually used; some Constructed Responses; some Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Teachers, writers, engineers, psychologists."
Prerequisites: None
Average Time: 3 hours (est.).
Next Revision: February, 1963.
(1 sample frame)

PROGRAMING

PROGRAMMED INSTRUCTION, The Process
Meacham; GRAFICROLL SYSTEMS
one sample frame:

From page 5

You selected - The present method of teaching the subject. This will result in three conditions:

1- The subject is not being taught
2- The present method of teaching is satisfactory
3- The present method of teaching is unsatisfactory

If you faind No.1 is the case, you are in good shape to introduce programmed instruction into the system. You cannot measure the difference between programmed instruction and conventional methods.
If you find No.2 to be the case, and it is doing a bang-up job, then your problems are over and you should select another subject.
If you find No.3 is the condition at the time, then by all means, consider programed instruction as a posible solution. Any area that is hard to teach is a good area to program. Plus you have a basis for a good comparison to conventional methods.

The most desireable situation to consider for programming a subject is: (select one)

____ When the subject is not being taught..
...turn to Page 8

____ When the present method of teaching the subject is not satisfactory.......
...turn to Page 10

6

PROGRAMED INSTRUCTION: A NEW APPROACH TO TEACHING AND LEARNING

RICHARD E. RIPPLE: School of Education, Cornell University
Published by SCHOOL OF EDUCATION, CORNELL UNIVERSITY,
Ithaca, New York

Programed text, 134 frames, paperback, 56 pp., 5 1/2" x 8 1/2", $.50.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Field tested on introductory psychology class of 300 students at Cornell University."
Prerequisites: None.
Average Time: 40 minutes (based entirely on data); standard deviation, 5 minutes.
Next Revision: "None contemplated."
(1 sample page)

PROGRAMING

PROGRAMED INSTRUCTION: A NEW APPROACH TO TEACHING AND LEARNING

Ripple; SCHOOL OF EDUCATION, CORNELL UNIVERSITY
one sample page:

p. 20

32. actively
33. involved

To summarize: in programed instruction, a new teaching $\underset{34}{\underline{\hspace{2cm}}}$, learning efficiency is increased by presenting subject matter to the student in a series of logically ordered $\underset{35}{\underline{\hspace{2cm}}}$ $\underset{36}{\underline{\hspace{2cm}}}$, requiring the student to be $\underset{37}{\underline{\hspace{2cm}}}$ $\underset{38}{\underline{\hspace{2cm}}}$ in the learning process by making a correct $\underset{39}{\underline{\hspace{2cm}}}$ to each step, and $\underset{40}{\underline{\hspace{2cm}}}$ his responses by providing him with $\underset{41}{\underline{\hspace{2cm}}}$ $\underset{42}{\underline{\hspace{2cm}}}$.

21

34. technique or method
35-36. small steps
37-38. actively involved
39. response
40. reinforcing
41-42. immediate feedback

Programing Techniques

In programed instruction it is essential that the student make a correct response. One of the ways to insure that the student makes a correct $\underset{43}{\underline{\hspace{2cm}}}$ is to present the subject matter in a series of small steps, called frames. Each step in a program is called a $\underset{44}{\underline{\hspace{2cm}}}$.

PROGRAMED INSTRUCTION AND PROGRAMING TECHNIQUE
A Manual for Programers
DALE M. BRETHOWER, University of Michigan
Published by EDUCATIONAL METHODS, Inc.,
612 North Michigan, Chicago, Illinois.

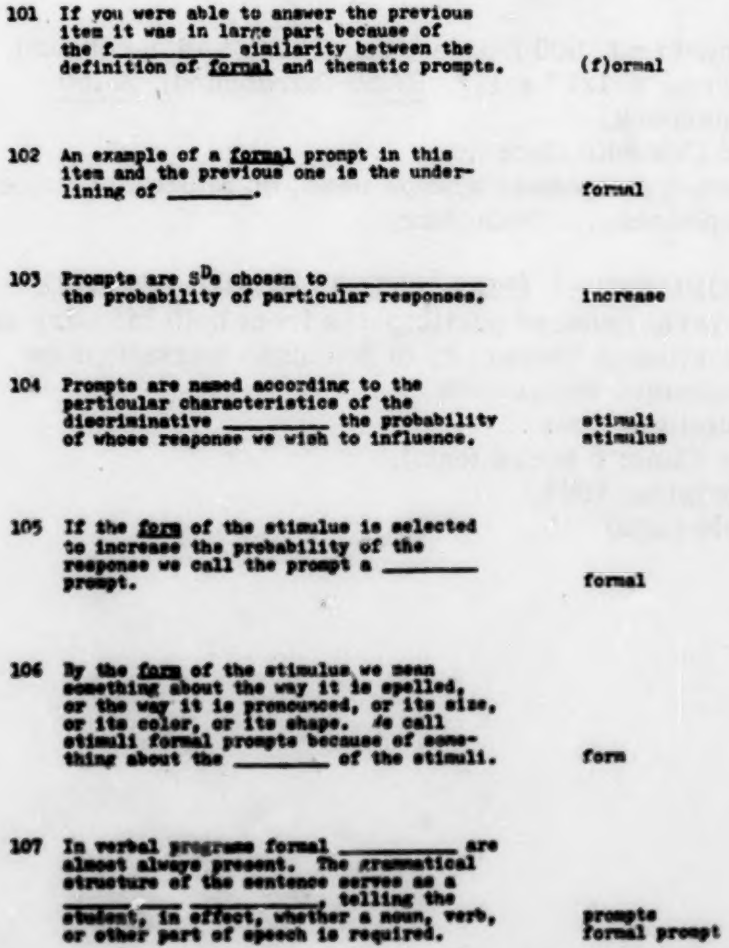
Programed text, 500 frames, paperback and hardbound, 150 pp., 8 1/2" x 11", $7.50 (hardbound), $3.50 (paperback).
Table of Contents, Index.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Several hundred participants from both industry and education in University of Michigan workshops on programed instruction."
Prerequisites: None.
Average Time: 5 hours (est.).
Next Revision: 1964.
(1 sample page)

PROGRAMED INSTRUCTION AND PROGRAMING TECHNIQUE

Brethower; EDUCATIONAL METHODS

one sample page:



101	If you were able to answer the previous item it was in large part because of the f__________ similarity between the definition of formal and thematic prompts.	(f)ormal
102	An example of a formal prompt in this item and the previous one is the underlining of ________.	formal
103	Prompts are S^Ds chosen to ______________ the probability of particular responses.	increase
104	Prompts are named according to the particular characteristics of the discriminative __________ the probability of whose response we wish to influence.	stimuli stimulus
105	If the form of the stimulus is selected to increase the probability of the response we call the prompt a _________ prompt.	formal
106	By the form of the stimulus we mean something about the way it is spelled, or the way it is pronounced, or its size, or its color, or its shape. We call stimuli formal prompts because of something about the ________ of the stimuli.	form
107	In verbal programs formal ___________ are almost always present. The grammatical structure of the sentence serves as a ______ ____ ____________, telling the student, in effect, whether a noun, verb, or other part of speech is required.	prompts formal prompt

PROGRAMED INSTRUCTION
What It Is and How It Works
OHMER MILTON, Dept. of Psychology, University of Tennessee
LEONARD J. WEST, Dept. of Business Education, Southern Illinois University
Published by HARCOURT, BRACE & WORLD, Inc.,
750 Third Avenue, New York 17, New York

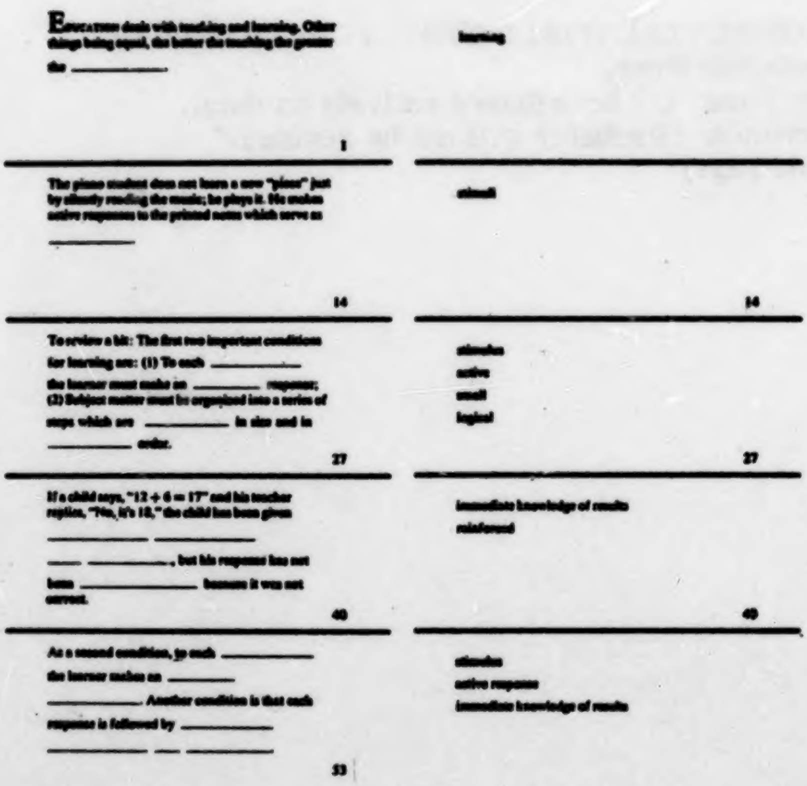
Programed text, 65 frames, paperback, 32 pp.,
3 3/4" x 8 3/4", $.60.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: None.
Average Time: 1/2 hour (based entirely on data).
Next Revision: "Probably will not be revised."
(1 sample page)

PROGRAMING

PROGRAMED INSTRUCTION
Milton, West; HARCOURT, BRACE & WORLD
one sample page:

From Programed Instruction: What It Is and How It Works by Ohmer Milton and Leonard J. West, © 1962 by Harcourt, Brace & World, Inc., and reprinted with their permission.



Education deals with teaching and learning. Other things being equal, the better the teaching the greater the ______ 1	learning
The piano student does not learn a new "piece" just by silently reading the music; he plays it. He makes active responses to the printed notes which serve as ______ 14	stimuli 14
To review a bit: The first two important conditions for learning are: (1) To each ______ the learner must make an ______ response; (2) Subject matter must be organized into a series of steps which are ______ in size and in ______ order. 27	stimulus active small logical 27
If a child says, "12 + 6 = 17" and his teacher replies, "No, it's 18," the child has been given ______ ______ ______ ______, but his response has not been ______ because it was not correct. 40	immediate knowledge of results reinforced 40
As a second condition, to each ______ the learner makes an ______ ______. Another condition is that each response is followed by ______ ______ ______ ______ 53	stimulus active response immediate knowledge of results

A PROGRAMED PRIMER ON PROGRAMING
Vol. I and Vol. II

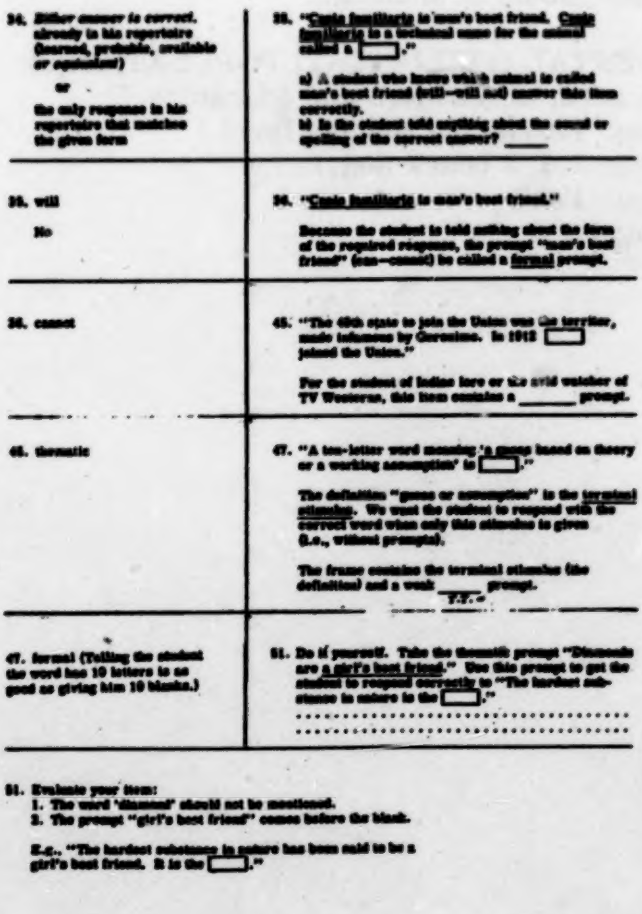
SUSAN MEYER MARKLE, Research Educationist,
University of Southern California
LEWIS D. EIGEN, Center for Programed Instruction
P. KENNETH KOMOSKI, Center for Programed Instruction.
Published by THE CENTER FOR PROGRAMED
INSTRUCTION, Inc.,
365 West End Avenue, New York 24, New York.

Programed text, 343 frames, paperback, 72 pp., 8 1/2" x 11", bound in 2 separate volumes at $1.00 each.
Constructed Responses usually used; some Multiple Choice Responses; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Over a hundred teachers and educators."
Prerequisites: 11th grade reading level.
Average Time: 2 1/2 hours (est.).
Next Revision: 1964.
(1 sample page)

PROGRAMING

A PROGRAMED PRIMER ON PROGRAMING
Markle, Eigen, Komoski; THE CENTER FOR PROGRAMED INSTRUCTION
one sample page:



34. *Either answer is correct.* already in his repertoire (learned, probable, available or equivalent) or the only response in his repertoire that matches the given form	35. "Canis familiaris is man's best friend. Canis familiaris is a technical name for the animal called a ☐." a) A student who knows which animal is called man's best friend (will—will not) answer this item correctly. b) Is the student told anything about the sound or spelling of the correct answer? ____
35. will No	36. "Canis familiaris is man's best friend." Because the student is told nothing about the form of the required response, the prompt "man's best friend" (can—cannot) be called a formal prompt.
36. cannot	45. "The 48th state to join the Union was the territory, made infamous by Geronimo. In 1912 ☐ joined the Union." For the student of Indian lore or the avid watcher of TV Westerns, this item contains a ______ prompt.
45. thematic	47. "A ten-letter word meaning 'a guess based on theory or a working assumption' is ☐." The definition "guess or assumption" is the terminal stimulus. We want the student to respond with the correct word when only this stimulus is given (i.e., without prompts). The frame contains the terminal stimulus (the definition) and a weak ______ prompt.
47. formal (Telling the student the word has 10 letters is as good as giving him 10 blanks.)	51. Do it yourself. Take the thematic prompt "Diamonds are a girl's best friend." Use this prompt to get the student to respond correctly to "The hardest substance in nature is the ☐." ....

51. Evaluate your item:
1. The word 'diamond' should not be mentioned.
2. The prompt "girl's best friend" comes before the blank.

E.g., "The hardest substance in nature has been said to be a girl's best friend. It is the ☐."

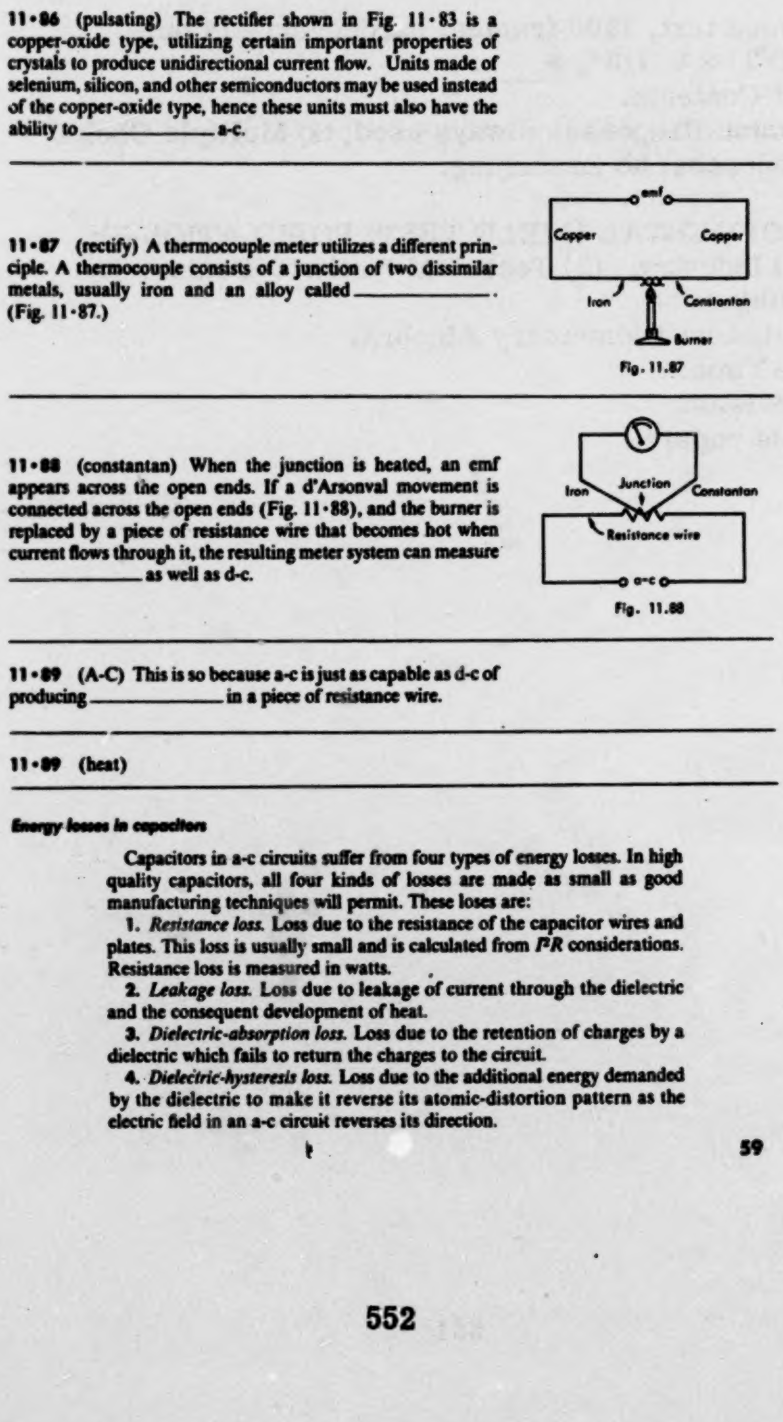
A PROGRAMMED COURSE IN BASIC ELECTRICITY
ALEXANDER SCHURE, New York Institute of Technology.
Published by McGRAW-HILL BOOK COMPANY, Inc.,
330 West 42nd Street, New York City.

Programed text, 1800 frames, hardcover, 414 pp.,
7 1/2" x 9 7/8", $___.
Table of Contents.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"(1) Industry, (2) Technical Institute-Community Colleges."
Prerequisites: Elementary Algebra.
Average Time:
Next Revision:
(1 sample page)

APPLIED SCIENCE

A PROGRAMMED COURSE IN BASIC ELECTRICITY
Schure; McGRAW-HILL BOOK COMPANY
one sample page:



11·86 (pulsating) The rectifier shown in Fig. 11·83 is a copper-oxide type, utilizing certain important properties of crystals to produce unidirectional current flow. Units made of selenium, silicon, and other semiconductors may be used instead of the copper-oxide type, hence these units must also have the ability to ____________ a-c.

11·87 (rectify) A thermocouple meter utilizes a different principle. A thermocouple consists of a junction of two dissimilar metals, usually iron and an alloy called ____________. (Fig. 11·87.)

Fig. 11.87

11·88 (constantan) When the junction is heated, an emf appears across the open ends. If a d'Arsonval movement is connected across the open ends (Fig. 11·88), and the burner is replaced by a piece of resistance wire that becomes hot when current flows through it, the resulting meter system can measure ____________ as well as d-c.

Fig. 11.88

11·89 (A-C) This is so because a-c is just as capable as d-c of producing ____________ in a piece of resistance wire.

11·89 (heat)

Energy losses in capacitors

Capacitors in a-c circuits suffer from four types of energy losses. In high quality capacitors, all four kinds of losses are made as small as good manufacturing techniques will permit. These loses are:

1. *Resistance loss.* Loss due to the resistance of the capacitor wires and plates. This loss is usually small and is calculated from I^2R considerations. Resistance loss is measured in watts.
2. *Leakage loss.* Loss due to leakage of current through the dielectric and the consequent development of heat.
3. *Dielectric-absorption loss.* Loss due to the retention of charges by a dielectric which fails to return the charges to the circuit.
4. *Dielectric-hysteresis loss.* Loss due to the additional energy demanded by the dielectric to make it reverse its atomic-distortion pattern as the electric field in an a-c circuit reverses its direction.

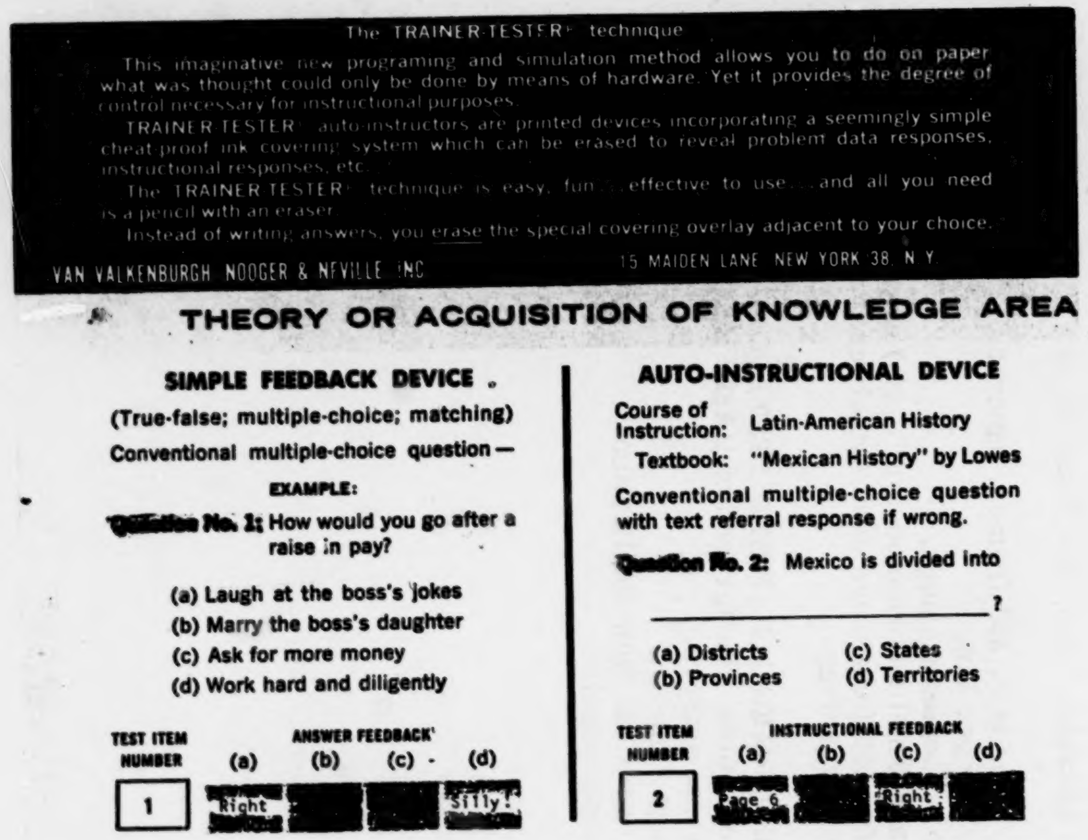
BASIC INDUSTRIAL ELECTRICITY
Volumes 1 and 2 with "Programed Training Package Supplement," No. 318-Q
VAN VALKENBURGH, NOOGER & NEVILLE, Inc.
Published by VAN VALKENBURGH, NOOGER & NEVILLE, Inc.,
15 Maiden Lane, New York 38, N.Y.

Programed text, 253 frames, paperback, 253 pp., 6" x 9", $3.50 per Vol.
Table of Contents, Index.
Unit and Final and Diagnostic Test(s) available.
Constructed Responses used sometimes; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: Background of BASIC ELECTRICITY by same authors.
Average Time:
Next Revision: New Publication.
(1 sample page)

APPLIED SCIENCE

BASIC INDUSTRIAL ELECTRICITY
Van Valkenburgh, Nooger & Neville; VAN VALKENBURGH, NOOGER & NEVILLE
one sample page:



The TRAINER-TESTER® technique

This imaginative new programing and simulation method allows you to do on paper what was thought could only be done by means of hardware. Yet it provides the degree of control necessary for instructional purposes.

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VAN VALKENBURGH, NOOGER & NEVILLE, INC. 15 MAIDEN LANE, NEW YORK 38, N. Y.

THEORY OR ACQUISITION OF KNOWLEDGE AREA

SIMPLE FEEDBACK DEVICE

(True-false; multiple-choice; matching)

Conventional multiple-choice question—

EXAMPLE:

Question No. 1: How would you go after a raise in pay?

(a) Laugh at the boss's jokes
(b) Marry the boss's daughter
(c) Ask for more money
(d) Work hard and diligently

TEST ITEM NUMBER	ANSWER FEEDBACK (a)	(b)	(c)	(d)
1	Right			Silly!

AUTO-INSTRUCTIONAL DEVICE

Course of Instruction: Latin-American History
Textbook: "Mexican History" by Lowes

Conventional multiple-choice question with text referral response if wrong.

Question No. 2: Mexico is divided into

____________________?

(a) Districts
(b) Provinces
(c) States
(d) Territories

TEST ITEM NUMBER	INSTRUCTIONAL FEEDBACK (a)	(b)	(c)	(d)
2	Page 6		Right	

APPLIED SCIENCE H.S.+

SECONDARY SCIENCE SERIES - FUNDAMENTALS OF ELECTRICITY, D.C.
DONALD T. TOSTI, Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION.
575 Lexington Avenue, New York 22, N.Y.

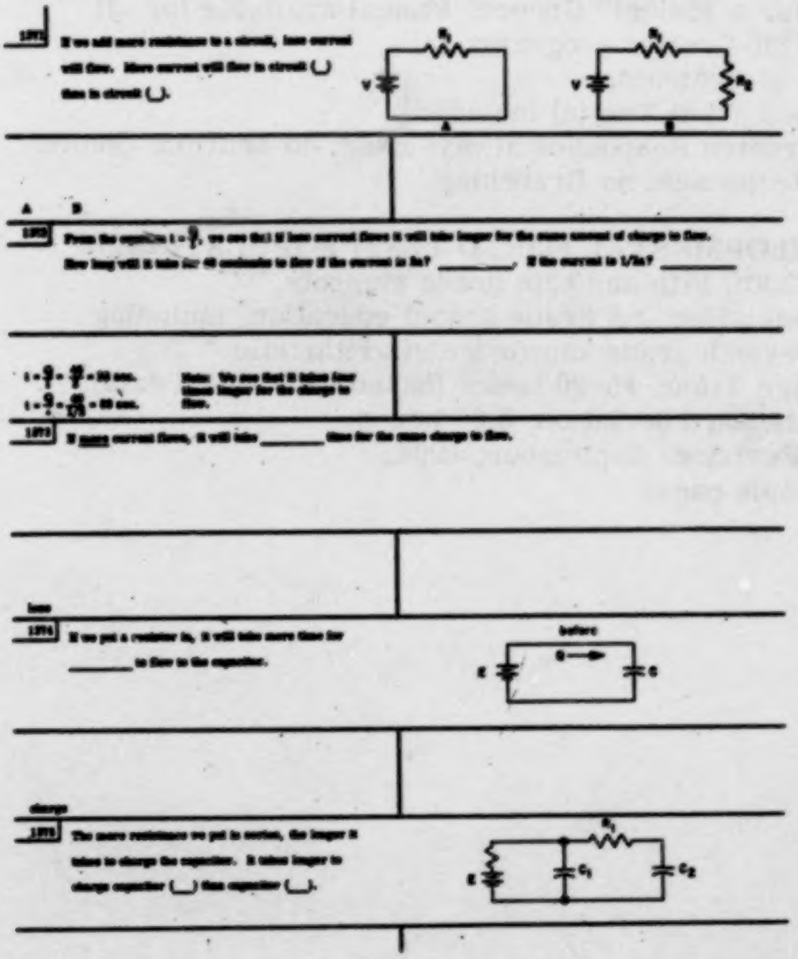
Programed text, 1,453 frames, paperback, 313 pp., 8 1/2" x 11", $11.00.
For use in MIN/MAX II machine, $25.00; program reusable, $10.00.
Teacher's Manual: General Manual available for all TMI-Grolier programs.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "10th, 11th and 12th grade students."
Prerequisites: "A grade school education, including seventh grade knowledge of arithmetic."
Average Time: 15-20 hours (based entirely on data); standard deviation, 6.86 hours.
Next Revision: September, 1964.
(1 sample page)

APPLIED SCIENCE

SECONDARY SCIENCE SERIES – FUNDAMENTALS OF ELECTRICITY, D.C.

Tosti; TEACHING MATERIALS CORPORATION
one sample page:



APPLIED SCIENCE Coll.

CAPACITANCE & CAPACITORS
ROBERT H. KANTOR, Varian Associates
Published by VARIAN ASSOCIATES,
611 Hansen Way, Palo Alto, California.

Programed text, 115 frames, paperback, 120 pp.,
6" x 9", $3.00.
Table of Contents.
Final and Diagnostic Test(s) included.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

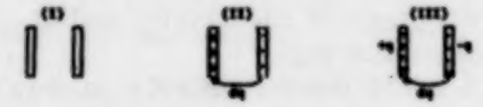
DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Thirty college-level physics students who had mastered the prerequisite material, but who had not formally studied capicitance and capacitors." From the Preface, First Edition.
Prerequisites: "First part of an elementary college course in electricity and magnetism (more specifically, the first seven chapters of Electricity and Magnetism by Sears, or equivalent text.")
Average Time: 2 hours (based entirely on data).
Next Revision:
(1 sample page)

APPLIED SCIENCE

CAPACITANCE & CAPACITORS
Kantor; VARIAN ASSOCIATES
one sample page:

We are now ready to study energy relationships in a capacitor. The process of charging a capacitor consists of transferring charge from the plate at lower potential to the plate at higher potential. The charging process therefore requires the expenditure of energy.

Imagine the charging process to be carried out by starting out with both plates completely uncharged, and then repeatedly removing small positive charge dq from one plate and transferring them to the other plate.



At a stage of this process when the total quantity of charge transferred has reached an amount q, (picture III above) the potential difference between the plates is

$$V = \frac{q}{C}$$

and the work dW necessary to transfer the next charge dq is

$$dW = V\ dq = \frac{q}{C}\ dq$$

What do you think we should do now?

(a) Integrate . . . . page 69 ☐
(b) Express C in terms of q, then integrate . . . . . page 71 ☐

APPLIED SCIENCE Open

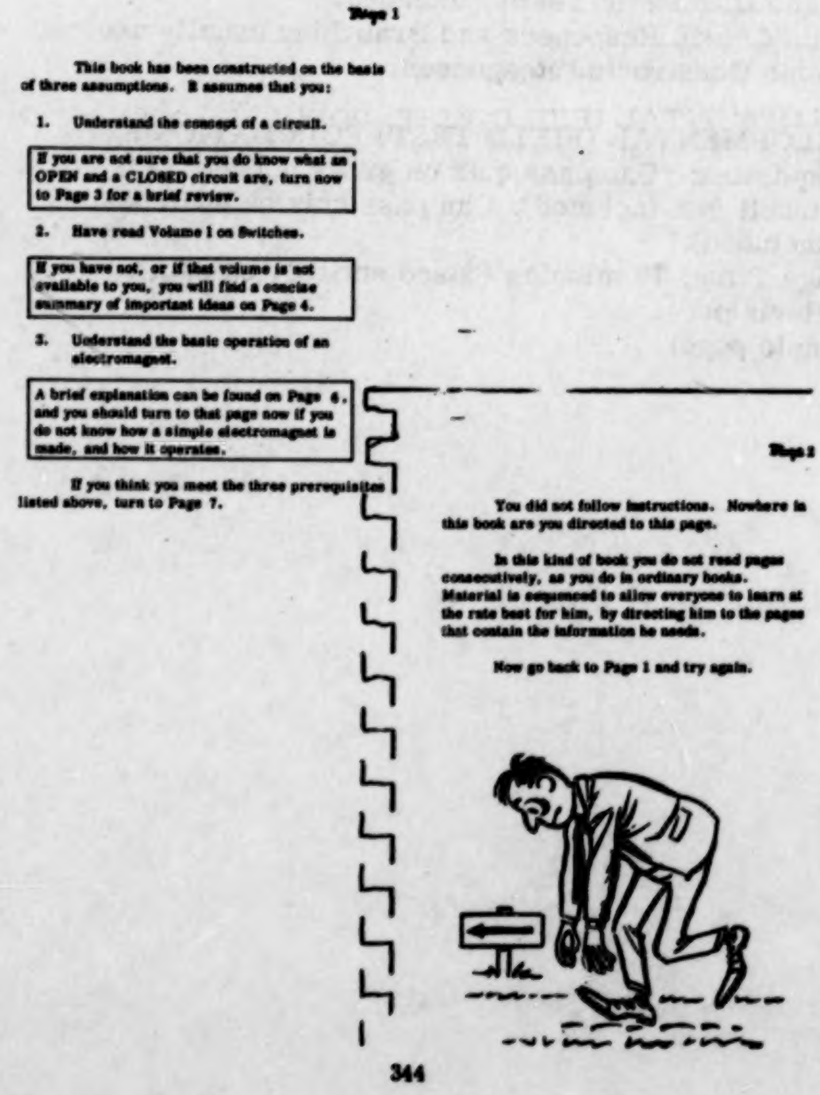
RELAYS
ROBERT H. KANTOR
ROBERT F. MAGER, both of Varian Associates.
Published by VARIAN ASSOCIATES,
611 Hansen Way, Palo Alto, California.

Programed text, 95 frames, paperback, 100 pp.,
5 1/2" x 8 1/2", $.85.
Final and Diagnostic Test(s) included.
Multiple Choice Responses and Branching usually used;
some Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: "Can pass quiz on gross concept of a circuit (not included). Can pass quiz on switches (included)."
Average Time: 75 minutes (based entirely on data).
Next Revision:
(1 sample page)

APPLIED SCIENCE

RELAYS
Kantor, Mager; VARIAN ASSOCIATES
one sample page:



Page 1

This book has been constructed on the basis of three assumptions. It assumes that you:

1. Understand the concept of a circuit.

If you are not sure that you do know what an OPEN and a CLOSED circuit are, turn now to Page 3 for a brief review.

2. Have read Volume I on Switches.

If you have not, or if that volume is not available to you, you will find a concise summary of important ideas on Page 4.

3. Understand the basic operation of an electromagnet.

A brief explanation can be found on Page 6, and you should turn to that page now if you do not know how a simple electromagnet is made, and how it operates.

If you think you meet the three prerequisites listed above, turn to Page 7.

Page 2

You did not follow instructions. Nowhere in this book are you directed to this page.

In this kind of book you do not read pages consecutively, as you do in ordinary books. Material is sequenced to allow everyone to learn at the rate best for him, by directing him to the pages that contain the information he needs.

Now go back to Page 1 and try again.

344

APPLIED SCIENCE Open

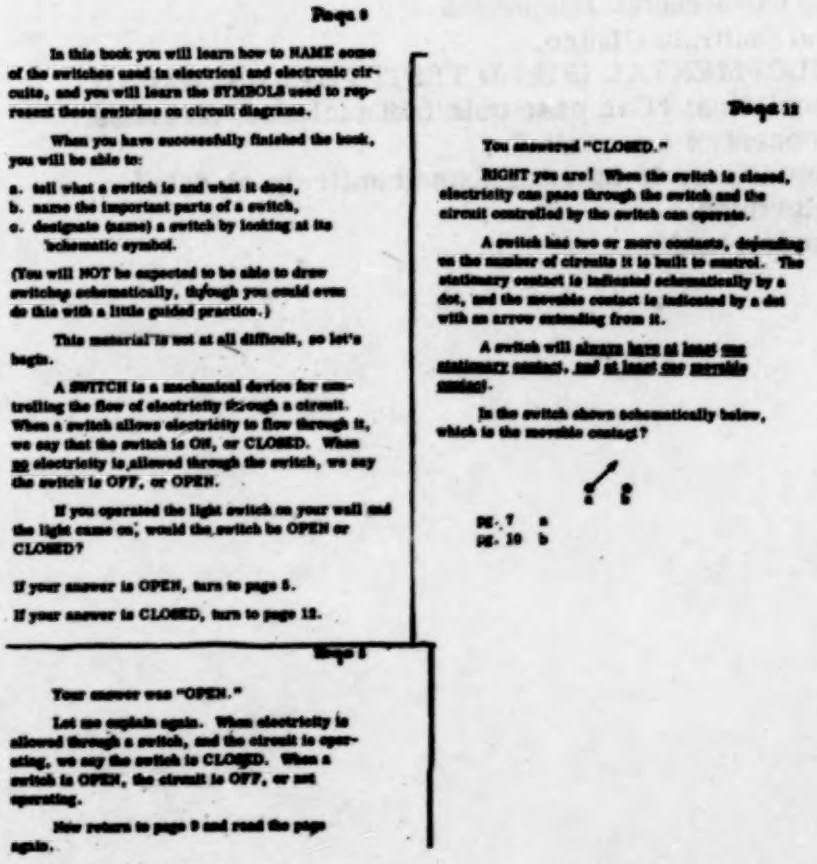
SWITCHES
ROBERT F. MAGER, Varian Associates
Published by VARIAN ASSOCIATES,
611 Hansen Way, Palo Alto, California.

Programed text, 58 frames, paperback, 66 pp.,
5 1/2" x 8 1/2", $.75.
Final and Diagnostic Test(s) included.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: "Can pass quiz (not included) on gross concept of a circuit."
Average Time: 40 minutes (based entirely on data).
Next Revision:
(1 sample page)

APPLIED SCIENCE

SWITCHES
Mager; VARIAN ASSOCIATES
one sample page:



Page 9

In this book you will learn how to NAME some of the switches used in electrical and electronic circuits, and you will learn the SYMBOLS used to represent these switches on circuit diagrams.

When you have successfully finished the book, you will be able to:

a. tell what a switch is and what it does,
b. name the important parts of a switch,
c. designate (name) a switch by looking at its schematic symbol.

(You will NOT be expected to be able to draw switches schematically, though you could even do this with a little guided practice.)

This material is not at all difficult, so let's begin.

A SWITCH is a mechanical device for controlling the flow of electricity through a circuit. When a switch allows electricity to flow through it, we say that the switch is ON, or CLOSED. When no electricity is allowed through the switch, we say the switch is OFF, or OPEN.

If you operated the light switch on your wall and the light came on, would the switch be OPEN or CLOSED?

If your answer is OPEN, turn to page 5.

If your answer is CLOSED, turn to page 12.

Page 5

Your answer was "OPEN."

Let me explain again. When electricity is allowed through a switch, and the circuit is operating, we say the switch is CLOSED. When a switch is OPEN, the circuit is OFF, or not operating.

Now return to page 9 and read the page again.

Page 12

You answered "CLOSED."

RIGHT you are! When the switch is closed, electricity can pass through the switch and the circuit controlled by the switch can operate.

A switch has two or more contacts, depending on the number of circuits it is built to control. The stationary contact is indicated schematically by a dot, and the movable contact is indicated by a dot with an arrow extending from it.

A switch will always have at least one stationary contact, and at least one movable contact.

In the switch shown schematically below, which is the movable contact?

pg. 7 a
pg. 10 b

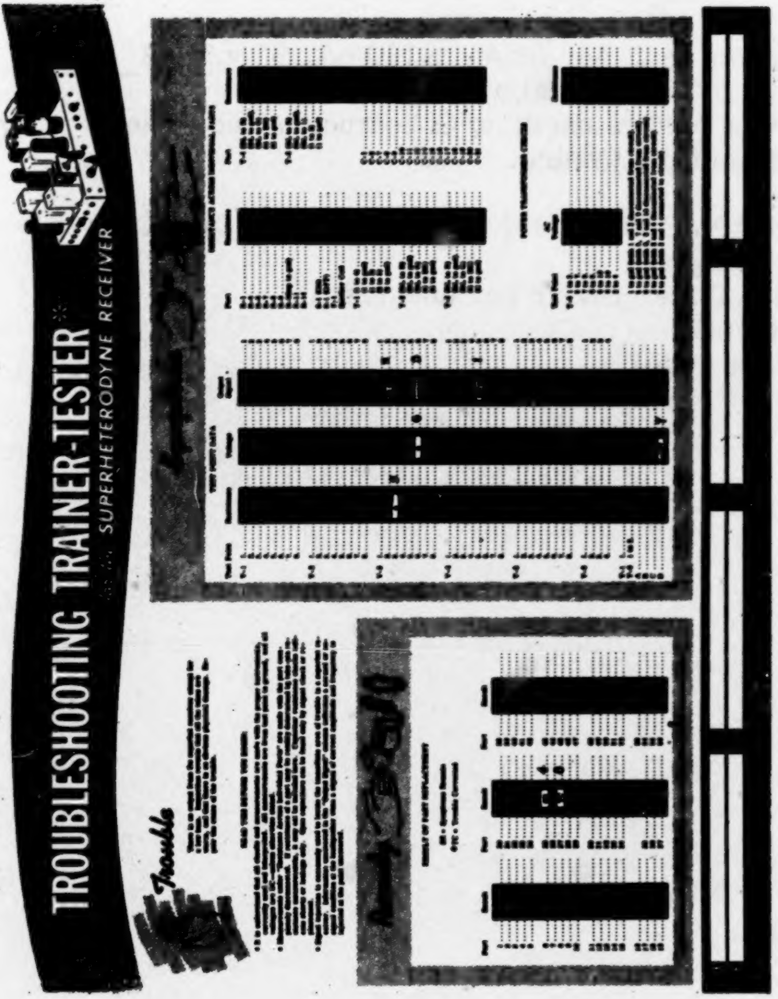
BASIC ELECTRONICS
Printed Programing Device
VAN VALKENBURGH, NOOGER & NEVILLE, Inc.
Published by VAN VALKENBURGH, NOOGER & NEVILLE, Inc.
15 Maiden Lane, New York 38, N.Y.

Programed text, 400 frames, 130 pp., 6" x 9", $______.
Diagnostic Test(s) available.
Branching always used; no Constructed Responses; no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATIONS(S).
Prerequisites:
Average Time: 1 hour per unit (est.)
Next Revision:
(1 sample page)

APPLIED SCIENCE

BASIC ELECTRONICS
Van Valkenburgh, Nooger & Neville; VAN VALKENBURGH, NOOGER & NEVILLE
one sample page:



TROUBLESHOOTING TRAINER-TESTER

SUPERHETERODYNE RECEIVER

Trouble

BASIC ELECTRONICS 07
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 7560 frames, paperback, 252 pp.,
5" x 7", available in 7 separate units at $3.75 each.
For use in SPEED machine, program reusable, $70.00
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: Arithmetic, elementary algebra.
Additional material required: SPEED machine, $700 & $850.
Average Time: 14 hours (est.).
Next Revision:
(1 sample page)

APPLIED SCIENCE

BASIC ELECTRONICS 07
EDUCATION ENGINEERING
one sample page

OHM'S LAW

In 1826, Simon Ohm, a German physicist, discovered that a definite relationship exists between current, voltage and resistance. Using very poor and deficient apparatus, he devised what is known as Ohm's law, a very powerful tool in solving electrical circuit problems.

Ohm's law states that the current in an electrical circuit is proportional to the voltage and inversely proportional to the resistance.

0701-S01

Ohm's law is represented in three forms. One form is that the current equals the voltage divided by the resistance, that is,

$$\text{Current} = \frac{\text{Voltage}}{\text{Resistance}},$$

or in symbol form,

$$I = \frac{E}{R}.$$

where the units are:

ampere for I
volt for E
Ohm for R

To summarize,

$$\text{Current} = \frac{\text{Voltage}}{\text{Resistance}}$$

$$I(\text{amperes}) = \frac{E(\text{volts})}{R(\text{ohms})}$$

1. Volt represents the symbol ____ in Ohm's law.
2. Ohm represents the symbol ____ in Ohm's law.
3. Ampere represents the symbol __ in Ohm's law.
4. Ohm's law states that the current is equal to the voltage divided by the ________.
5. A battery in a circuit would represent the ____ in Ohm's law.

1. Voltage
2. R
3. Resistance
4. Current
5. Ohms
6. I
7. C
8. O
9. E
10. V

0701-Q01

APPLIED SCIENCE

Jr. H.S.-Coll.
Tech. Ed.

FIRST YEAR ELECTRONICS (Volume I-V)
Vol. I - Direct Current; Vol. II - Alternating Current; Vol. III - Reactive Circuits; Vol. IV - Principles of Vacuum Tubes & Transistors; Vol. V - Special Purpose Tubes
PETER PIPE, et al., Educational Science Divsion, U.S. Industries.
Published by EDUCATIONAL SCIENCE DIVISION,
U.S. INDUSTRIES,
250 Park Avenue, New York, New York

FOR USE IN AUTOTUTOR MARK II machine, $1,250; program reusable, 5500 information frames, 13500 film images, Vol. I-V, $375.
Teacher's Manual available, free.
Table of Contents.
Unit Test(s) available.
Multiple Choice Responses and Branching always used; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Air Force electronics trainees."
Prerequisites: High school education.
Average Time: 120-150 hours (est.).
Next Revision: "Unscheduled."
(1 sample page)

APPLIED SCIENCE

FIRST YEAR ELECTRONICS
Peter Pipe, et al.; EDUCATIONAL SCIENCE DIVISION,
U.S. INDUSTRIES
one sample page:

Sample from First Year Electronics

580

YOUR ANSWER: AC current changes in polarity and magnitude at a periodic rate.

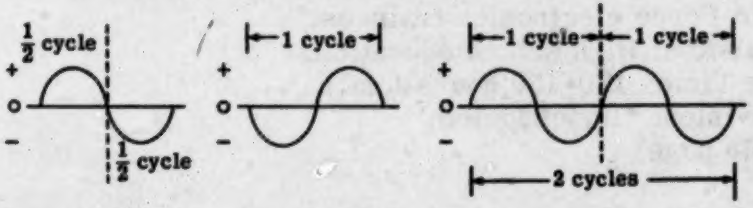
Correct.

Let's reiterate a few basic points just to insure that you understand a-c current:

The change in polarity and magnitude is symmetrical in standard a-c current.

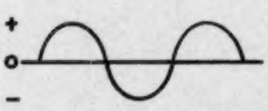
The number of times each change takes place is uniform; each a-c cycle will recur at a fixed frequency.

Now, each complete positive or negative swing of a-c current is called a half-cycle.



Each complete positive and negative swing of a-c current is called one cycle.

How would you identify the illustration below?



The illustration shows two cycles of a-c current.	C
The illustration shows three cycles of a-c current.	B
The illustration shows one and one-half cycles of a-c current.	A

APPLIED SCIENCE H.S.-Adult

INTRODUCTION TO ELECTRONICS
ROBERT J. HUGHES
PETER PIPE
PAUL SANBORN*
JAMES B. OWENS*, all of U.S. Industries Educational Science Division
Published by DOUBLEDAY & COMPANY, Inc.,
575 Madison Avenue, New York, New York.
British Edition published by THE ENGLISH UNIVERSITIES PRESS, Ltd.

Programed text, 400 frames, hardcover, 418 pp., 8 1/4" x 5 3/8", $4.95.
A similar program, ELEMENTARY ELECTRONICS, is available in TM format.
Published by EDUCATIONAL SCIENCE DIVISION,
U.S. INDUSTRIES,
250 Park Avenue, New York, N.Y.
For use in AUTOTUTOR MARK II machine, $1,250; program reusable, 439 information frames, 1233 film images, $100.
Table of Contents (text and machine); Index (text).
Unit Test(s) available (machine).
Multiple Choice Responses and Branching always used; no Constructed Responses.

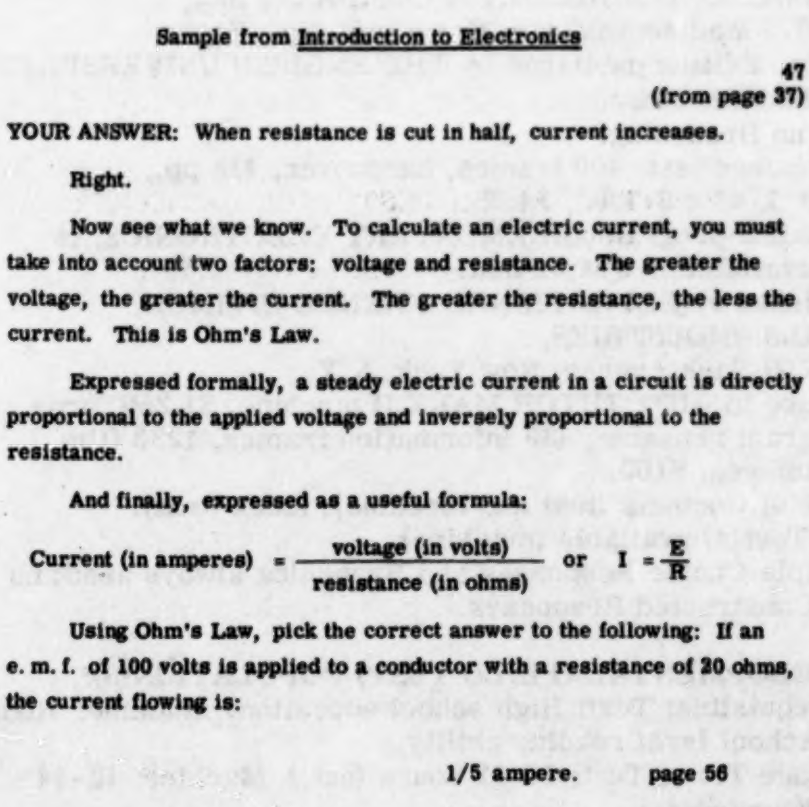
DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: Text: High school education. Machine: High school level reading ability.
Average Time: Text: 10-12 hours (est.). Machine: 12-14 hours (est.).
Next Revision: Text: "Dependent on publisher's sales needs." Machine: "Not scheduled."
(1 sample page)

*Machine version only.

APPLIED SCIENCE

INTRODUCTION TO ELECTRONICS

Hughes, Pipe, Sanborn, Owens; DOUBLEDAY & COMPANY
one sample page:



Sample from Introduction to Electronics

47
(from page 37)

YOUR ANSWER: When resistance is cut in half, current increases.

Right.

Now see what we know. To calculate an electric current, you must take into account two factors: voltage and resistance. The greater the voltage, the greater the current. The greater the resistance, the less the current. This is Ohm's Law.

Expressed formally, a steady electric current in a circuit is directly proportional to the applied voltage and inversely proportional to the resistance.

And finally, expressed as a useful formula:

$$\text{Current (in amperes)} = \frac{\text{voltage (in volts)}}{\text{resistance (in ohms)}} \quad \text{or} \quad I = \frac{E}{R}$$

Using Ohm's Law, pick the correct answer to the following: If an e. m. f. of 100 volts is applied to a conductor with a resistance of 20 ohms, the current flowing is:

1/5 ampere.	page 56
5 amperes.	page 58

APPLIED SCIENCE

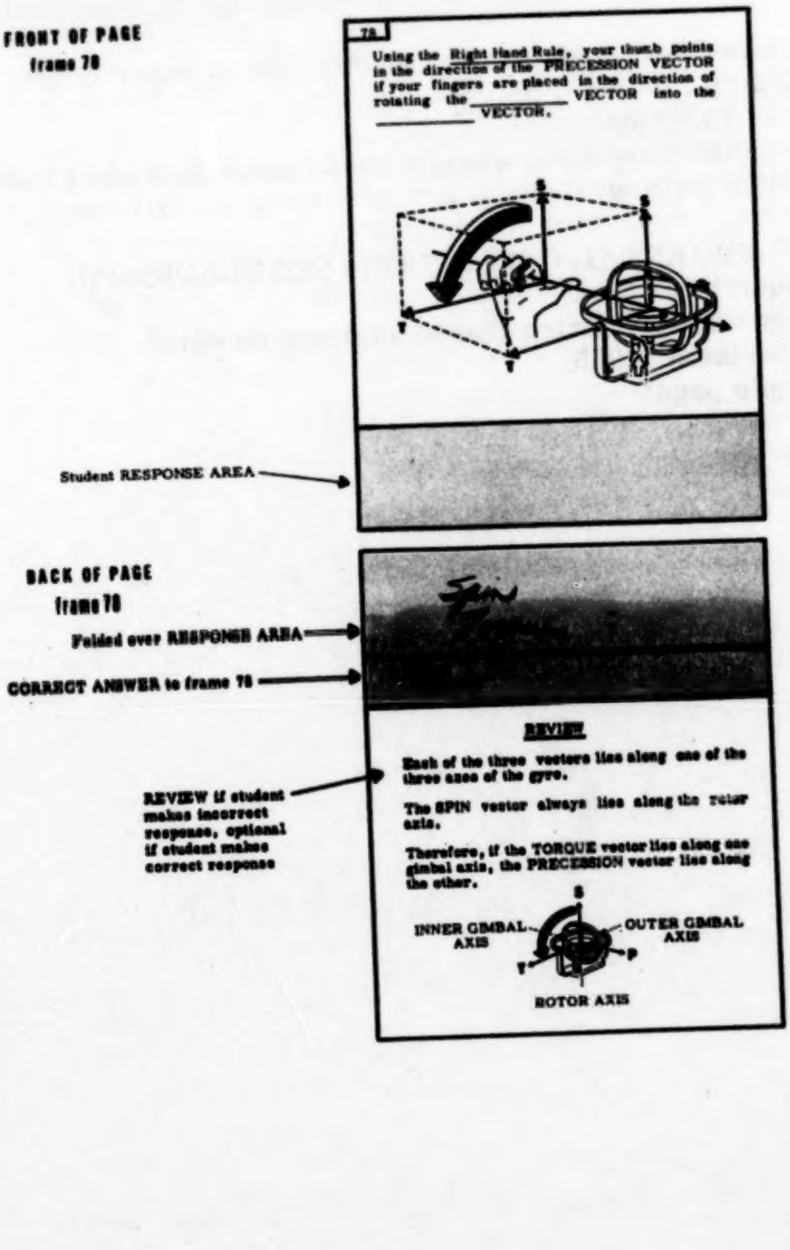
GYRO FUNDAMENTALS
STANLEY L. LEVINE, Vice President, Training Systems, Inc.
Published by TRAINING SYSTEMS, Inc.,
12248 Santa Monica Blvd., Los Angeles 25, California.

Programed text, 103 frames, plastic coated paper cover, 128 pp., 5" x 7", $4.95.
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: None
Average Time: 2 hours (based entirely on data).
Next Revision: 1965.
(1 sample page)

APPLIED SCIENCE

GYRO FUNDAMENTALS
Levine; TRAINING SYSTEMS
one sample frame:



FRONT OF PAGE
frame 78

78

Using the Right Hand Rule, your thumb points in the direction of the PRECESSION VECTOR if your fingers are placed in the direction of rotating the ______ VECTOR into the ______ VECTOR.

Student RESPONSE AREA

BACK OF PAGE
frame 78

Folded over RESPONSE AREA

Spin

CORRECT ANSWER to frame 78

REVIEW

Each of the three vectors lies along one of the three axes of the gyro.

The SPIN vector always lies along the rotor axis.

Therefore, if the TORQUE vector lies along one gimbal axis, the PRECESSION vector lies along the other.

REVIEW if student makes incorrect response, optional if student makes correct response

APPLIED SCIENCE **Open**

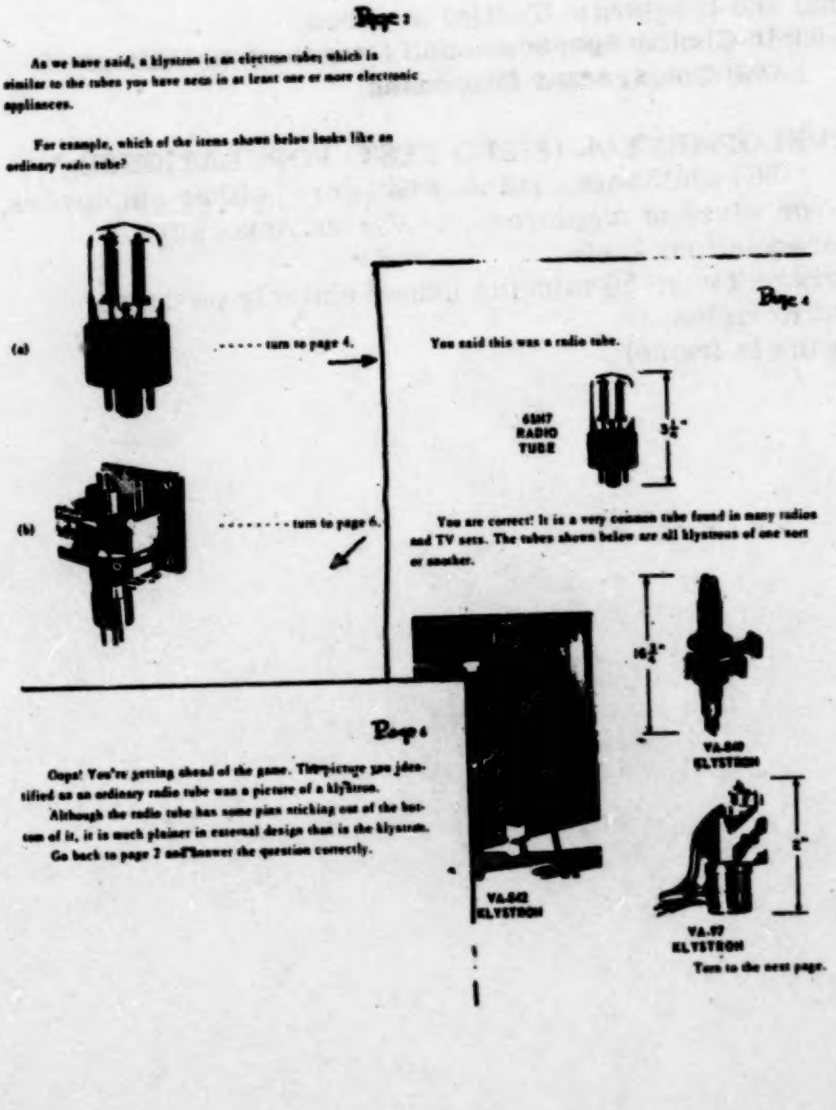
KLYSTRONS
ROBERT H. KANTOR
ROBERT F. MAGER, both of Varian Associates.
Published by VARIAN ASSOCIATES,
611 Hansen Way, Palo Alto, California.

Programed text, 85 frames, paperback, 93 pp., 5 1/2" x 8 1/2", $2.00.
Table of Contents.
Final and Diagnostic Test(s) included.
Multiple Choice Responses and Branching usually used; some Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"[26] adult young ladies who [were] either employees, or wives of employees, of Varian Associates."
Prerequisites: None
Average Time: 50 minutes (based entirely on data).
Next Revision:
(1 sample frame)

APPLIED SCIENCE

KLYSTRONS
Kantor, Mager; VARIAN ASSOCIATES
one sample page:



Page 2

As we have said, a klystron is an electron tube, which is similar to the tubes you have seen in at least one or more electronic appliances.

For example, which of the items shown below looks like an ordinary radio tube?

(a) ‐ ‐ ‐ ‐ ‐ turn to page 4.

(b) ‐ ‐ ‐ ‐ ‐ ‐ ‐ turn to page 6.

Page 4

You said this was a radio tube.

You are correct! It is a very common tube found in many radios and TV sets. The tubes shown below are all klystrons of one sort or another.

Turn to the next page.

Page 6

Oops! You're getting ahead of the game. The picture you identified as an ordinary radio tube was a picture of a klystron.

Although the radio tube has some pins sticking out of the bottom of it, it is much plainer in external design than is the klystron.

Go back to page 2 and answer the question correctly.

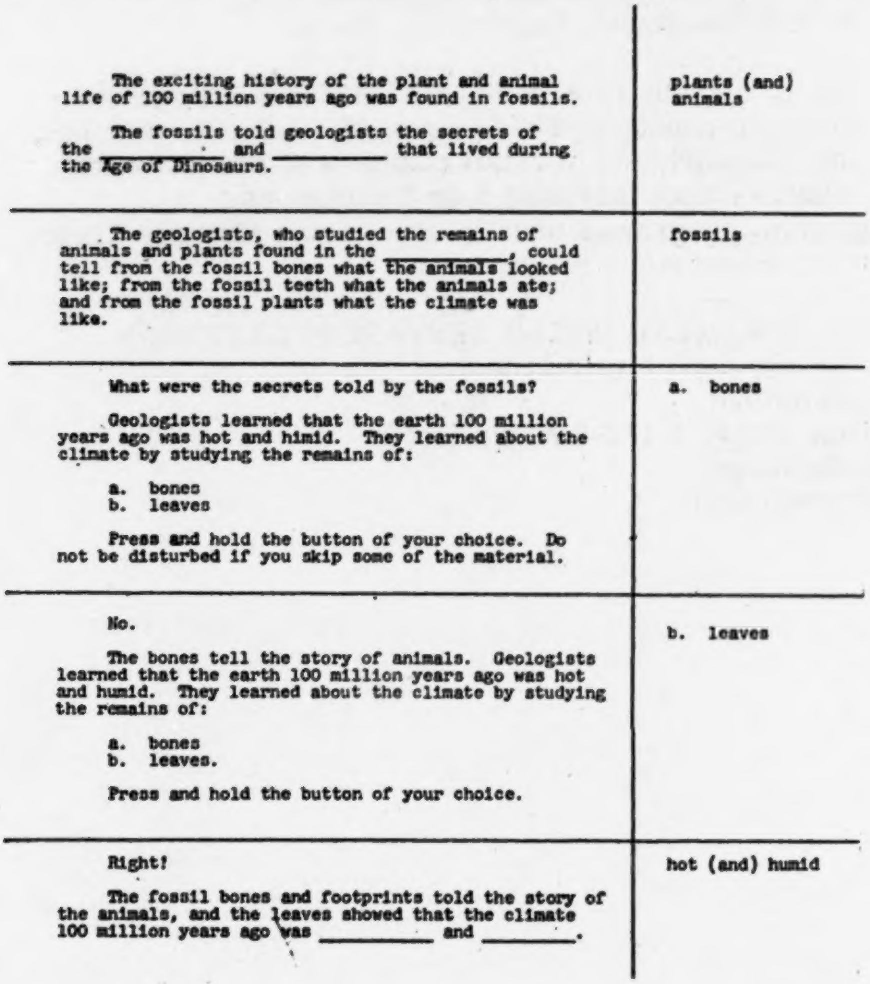
THE AGE OF THE DINOSAURS
Life 100 Million Years Ago
ARLENE GINSBERG, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.); program reusable, 200 frames, $2.00-$2.50. (Machine may be marketed in retail channels at this $20 combination price including 3 or 4 programs.)
Constructed Responses usually used; some Multiple Choice responses; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

GENERAL SCIENCE

THE AGE OF THE DINOSAURS
Ginsberg; HONOR PRODUCTS COMPANY
one sample page:



The exciting history of the plant and animal life of 100 million years ago was found in fossils. The fossils told geologists the secrets of the ________ and ________ that lived during the Age of Dinosaurs.	plants (and) animals
The geologists, who studied the remains of animals and plants found in the __________, could tell from the fossil bones what the animals looked like; from the fossil teeth what the animals ate; and from the fossil plants what the climate was like.	fossils
What were the secrets told by the fossils? Geologists learned that the earth 100 million years ago was hot and himid. They learned about the climate by studying the remains of: a. bones b. leaves Press and hold the button of your choice. Do not be disturbed if you skip some of the material.	a. bones
No. The bones tell the story of animals. Geologists learned that the earth 100 million years ago was hot and humid. They learned about the climate by studying the remains of: a. bones b. leaves. Press and hold the button of your choice.	b. leaves
Right! The fossil bones and footprints told the story of the animals, and the leaves showed that the climate 100 million years ago was __________ and ________.	hot (and) humid

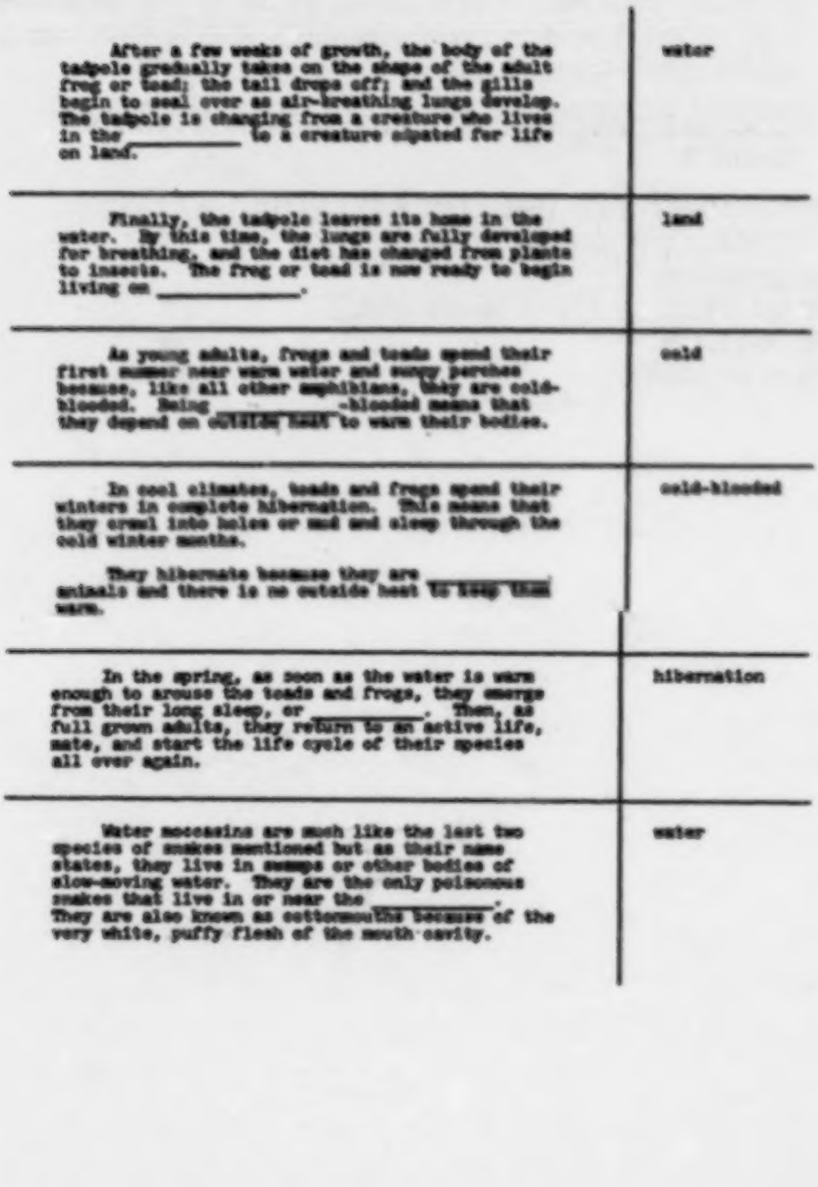
AMPHIBIANS AND REPTILES
WILLIAM L. EARLEY, Consultant Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.); program reusable, 200 frames, $2.00-$2.50 (Machine may be marketed in retail channels at this $20 combination price including 3 or 4 programs).
Constructed Responses usually used; some Branching; no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

GENERAL SCIENCE

AMPHIPIANS AND REPTILES
Earley; HONOR PRODUCTS COMPANY
one sample page:



After a few weeks of growth, the body of the tadpole gradually takes on the shape of the adult frog or toad; the tail drops off; and the gills begin to seal over as air-breathing lungs develop. The tadpole is changing from a creature who lives in the __________ to a creature adapted for life on land.	water
Finally, the tadpole leaves its home in the water. By this time, the lungs are fully developed for breathing, and the diet has changed from plants to insects. The frog or toad is now ready to begin living on __________.	land
As young adults, frogs and toads spend their first summer near warm water and sunny perches because, like all other amphibians, they are cold-blooded. Being __________-blooded means that they depend on outside heat to warm their bodies.	cold
In cool climates, toads and frogs spend their winters in complete hibernation. This means that they crawl into holes or mud and sleep through the cold winter months. They hibernate because they are __________ animals and there is no outside heat to keep them warm.	cold-blooded
In the spring, as soon as the water is warm enough to arouse the toads and frogs, they emerge from their long sleep, or __________. Then, as full grown adults, they return to an active life, mate, and start the life cycle of their species all over again.	hibernation
Water moccasins are much like the last two species of snakes mentioned but as their name states, they live in swamps or other bodies of slow-moving water. They are the only poisonous snakes that live in or near the __________. They are also known as cottonmouths because of the very white, puffy flesh of the mouth cavity.	water

GENERAL SCIENCE Fifth Grade

THE BIGGEST REPTILES: ALLIGATORS AND CROCODILES

MARTA ZABORSKA, Programer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 30 frames, $.15.
Constructed Responses always used; no Multiple Choice; no Branching.

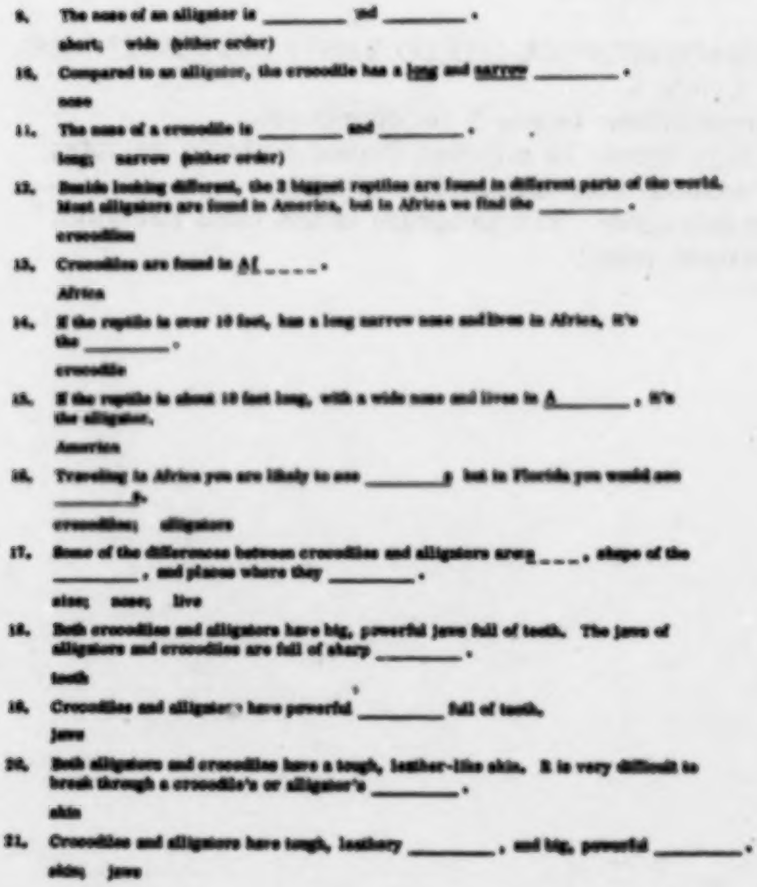
DEVELOPMENTAL (FIELD TEST) POPULATION(S): Grade 5.
Prerequisites: Grade 5 reading level.
Average Time: 19 minutes (based entirely on data); standard deviation, 2.5 minutes.
Next Revision: "The program is the final revision."
(1 sample page)

GENERAL SCIENCE

THE BIGGEST REPTILES: ALLIGATORS AND CROCODILES

Zaborska; LEARNING INCORPORATED

one sample page:



9. The nose of an alligator is ________ and ________.

short; wide (either order)

10. Compared to an alligator, the crocodile has a long and narrow ________.

nose

11. The nose of a crocodile is ________ and ________.

long; narrow (either order)

12. Beside looking different, the 2 biggest reptiles are found in different parts of the world. Most alligators are found in America, but in Africa we find the ________.

crocodiles

13. Crocodiles are found in Af_ _ _ _.

Africa

14. If the reptile is over 10 feet, has a long narrow nose and lives in Africa, it's the ________.

crocodile

15. If the reptile is about 10 feet long, with a wide nose and lives in A________, it's the alligator.

America

16. Traveling in Africa you are likely to see ________s but in Florida you would see ________s.

crocodiles; alligators

17. Some of the differences between crocodiles and alligators are: s_ _ _, shape of the ________, and places where they ________.

size; nose; live

18. Both crocodiles and alligators have big, powerful jaws full of teeth. The jaws of alligators and crocodiles are full of sharp ________.

teeth

19. Crocodiles and alligators have powerful ________ full of teeth.

jaws

20. Both alligators and crocodiles have a tough, leather-like skin. It is very difficult to break through a crocodile's or alligator's ________.

skin

21. Crocodiles and alligators have tough, leathery ________, and big, powerful ________.

skin; jaws

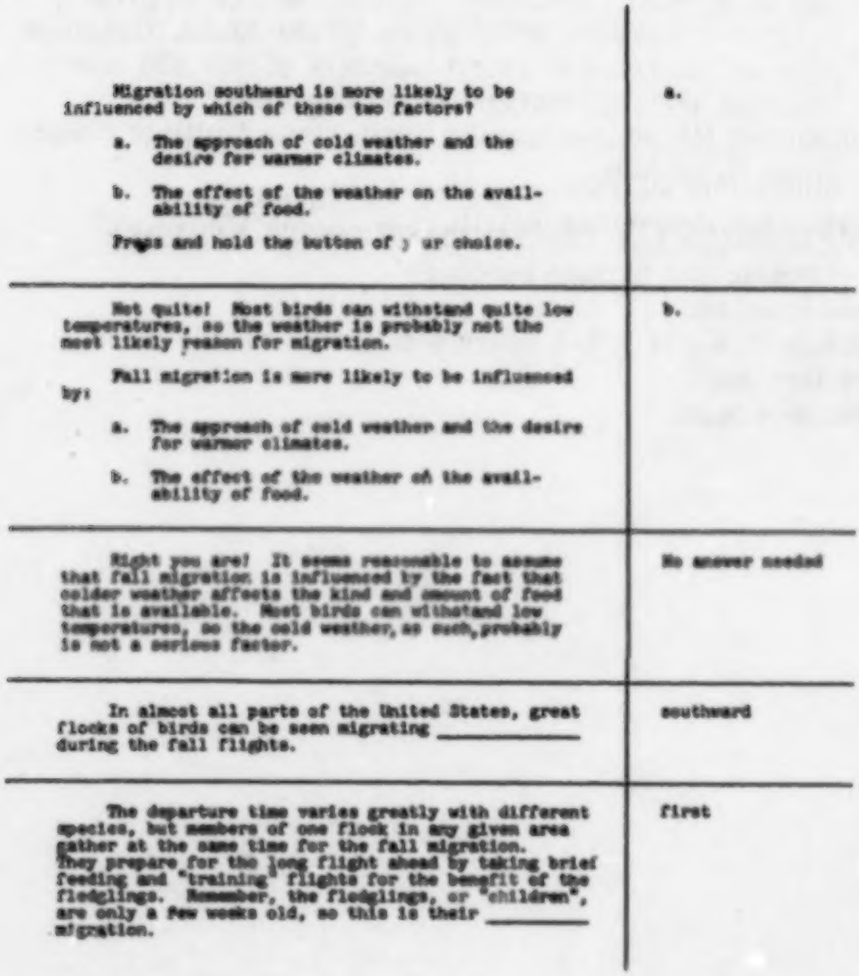
BIRD MIGRATION
WILLIAM L. EARLEY, Consultant Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.); program reusable, 200 frames, $2.00-$2.50. (Machine may be marketed in retail channels at this $20 combination price including 3 or 4 programs.)
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

GENERAL SCIENCE

BIRD MIGRATION
Earley; HONOR PRODUCTS COMPANY
one sample page:



Migration southward is more likely to be influenced by which of these two factors? a. The approach of cold weather and the desire for warmer climates. b. The effect of the weather on the availability of food. Press and hold the button of your choice.	a.
Not quite! Most birds can withstand quite low temperatures, so the weather is probably not the most likely reason for migration. Fall migration is more likely to be influenced by: a. The approach of cold weather and the desire for warmer climates. b. The effect of the weather on the availability of food.	b.
Right you are! It seems reasonable to assume that fall migration is influenced by the fact that colder weather affects the kind and amount of food that is available. Most birds can withstand low temperatures, so the cold weather, as such, probably is not a serious factor.	No answer needed
In almost all parts of the United States, great flocks of birds can be seen migrating ____________ during the fall flights.	southward
The departure time varies greatly with different species, but members of one flock in any given area gather at the same time for the fall migration. They prepare for the long flight ahead by taking brief feeding and "training" flights for the benefit of the fledglings. Remember, the fledglings, or "children", are only a few weeks old, so this is their __________ migration.	first

GENERAL SCIENCE Elem.-H.S.

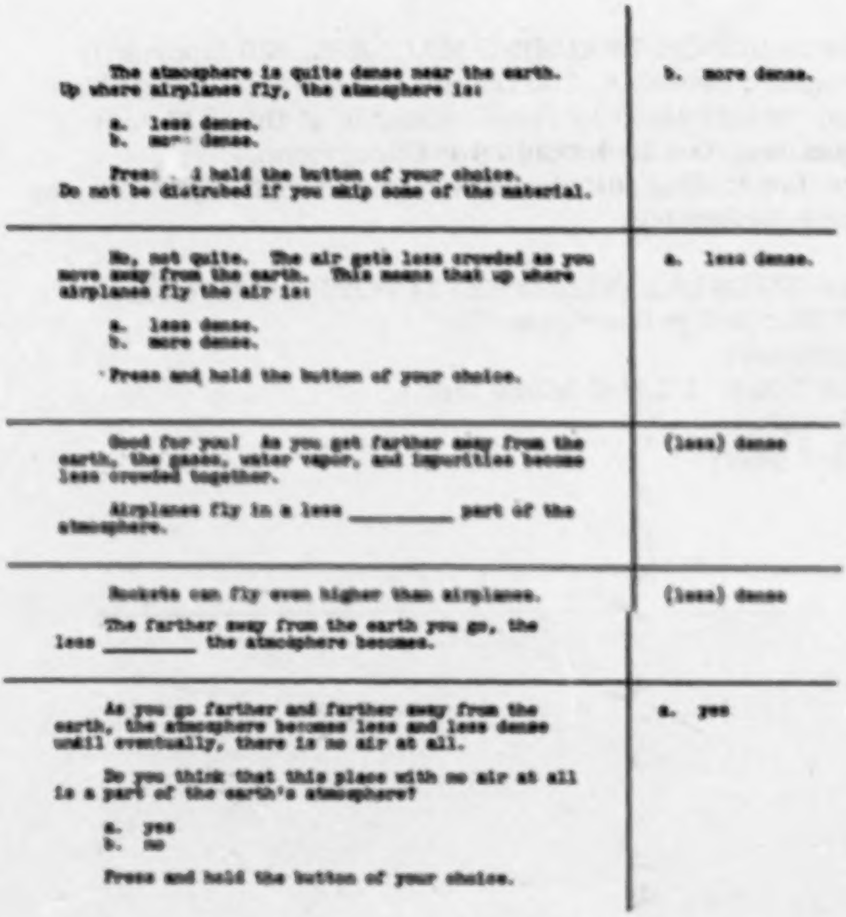
ELEMENTS OF THE WEATHER
Reasons for Weather Conditions
DIANE CUMMINGS, Programer
JEAN ANWYLL, Director of Programing
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.); program reusable, 200 frames, $2.00-$2.50. (Machine may be marketed in retail channels at this $20 combination price including 3 or 4 programs.)
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

GENERAL SCIENCE

ELEMENTS OF THE WEATHER
Cummings, Anwyll; HONOR PRODUCTS COMPANY
one sample page:



The atmosphere is quite dense near the earth. Up where airplanes fly, the atmosphere is: a. less dense. b. more dense. Press and hold the button of your choice. Do not be distrubed if you skip some of the material.	b. more dense.
No, not quite. The air gets less crowded as you move away from the earth. This means that up where airplanes fly the air is: a. less dense. b. more dense. Press and hold the button of your choice.	a. less dense.
Good for you! As you get farther away from the earth, the gases, water vapor, and impurities become less crowded together. Airplanes fly in a less _________ part of the atmosphere.	(less) dense
Rockets can fly even higher than airplanes. The farther away from the earth you go, the less _________ the atmosphere becomes.	(less) dense
As you go farther and farther away from the earth, the atmosphere becomes less and less dense untill eventually, there is no air at all. Do you think that this place with no air at all is a part of the earth's atmosphere? a. yes b. no Press and hold the button of your choice.	a. yes

GENERAL SCIENCE **Elem.**

EXPERIMENTS WITH SOUND
SHEILA LEVINSKY, Programer, Learning Incorporated.
Published by LEARNING INCORPORATED,
1317 W. Eighth Street, Tempe, Arizona.

Programed text, 23 frames, $.15.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL POPULATION(S): Grades 3, 4, 5.
Prerequisites: Grade 4 reading level.
Average Time: 25.3 minutes (based entirely on data); standard deviation, 2.6 minutes.
Next Revision: "The program is the final revision."
(1 sample page)

GENERAL SCIENCE

EXPERIMENTS WITH SOUND
Levinsky; LEARNING INCORPORATED
one sample page:

10. The sounds you make when you speak come from the vocal cords in your throat. Press your finger against your throat and hum ..... While you are humming you can feel your ________ ________ vibrating.

vocal cords

11. Do the experiment again. Keep your finger against your throat while you hum, then stop, and hum again ..... When you are not humming you ________(can cannot) feel your vocal cords vibrating.

cannot

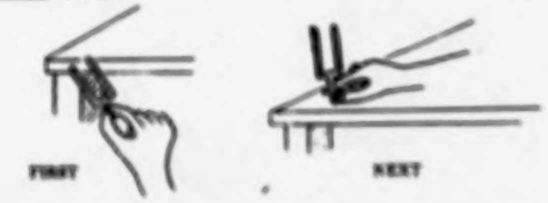
12. While they made a sound the rubber band and your vocal cords were both moving quickly back and forth. While they made a sound, they were both v _ b _ _ t _ _ g.

vibrating

13. A tuning fork can be used for sound experiments. A tuning fork looks something like an ordinary fork. Both have handles to hold them with, but a tuning fork has only ____(how many?) prongs.

two (2)

14.



Hold a tuning fork by the handle and hit one prong hard against the edge of the desk. Quickly stand it up on the desk and hold it there until the sound stops (REPEAT THIS UNTIL YOU CAN DO IT EASILY) ..... You were probably surprised that the sound lasted such a ________ time.

long

15. Is the tuning fork vibrating while it is sounding? To find out, hit one prong hard against the desk and dip both prongs into the glass of water. Watch the water carefully. ..... The fork makes the ________ splash.

water

16. The fork makes the water splash because the prongs are moving quickly b________ and f________. To say it in a scientific way, the prongs are ________.

back (and) forth; vibrating

17. When the tuning fork makes a sound, it is vibrating. This means that the prongs are moving quickly ________ and ________.

back (and) forth

18. You can do another experiment with the tuning fork. Strike it and stand it on the desk. While it is sounding, touch one of the prongs. ..... When you touch the prong, the sound ________.

stops

19. When you touch one of the prongs, it stops vibrating. If the fork does not vibrate, it cannot make any ________.

sound

FLOWER PARTS
JANE LARIMORE, Programer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 34 frames, $.15.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Grades, 5, 6.
Prerequisites: Fifth grade reading vocabulary.
Average Time: 30 minutes (est.).
Next Revision: "The program is the final revision."
(1 sample page)

GENERAL SCIENCE

FLOWER PARTS
Larimore; LEARNING INCORPORATED
one sample page:

Figure 1

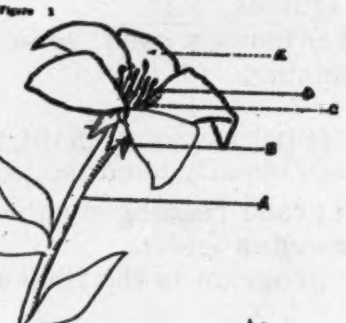
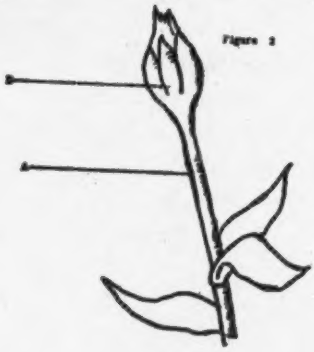


Figure 2



Flower Parts

1. The upper drawing is a picture of a _________.

   flower

2. Before this flower blossomed it looked like the lower drawing and was called a flower b_ _ _.

   bud

3. The green flower parts covering the flower bud are called sepals. The sepals are _________ (what color?)

   green

4. The sepals protect the bud until it blossoms into a _________.

   flower

GENERAL SCIENCE Elem.-Jr. H.S.

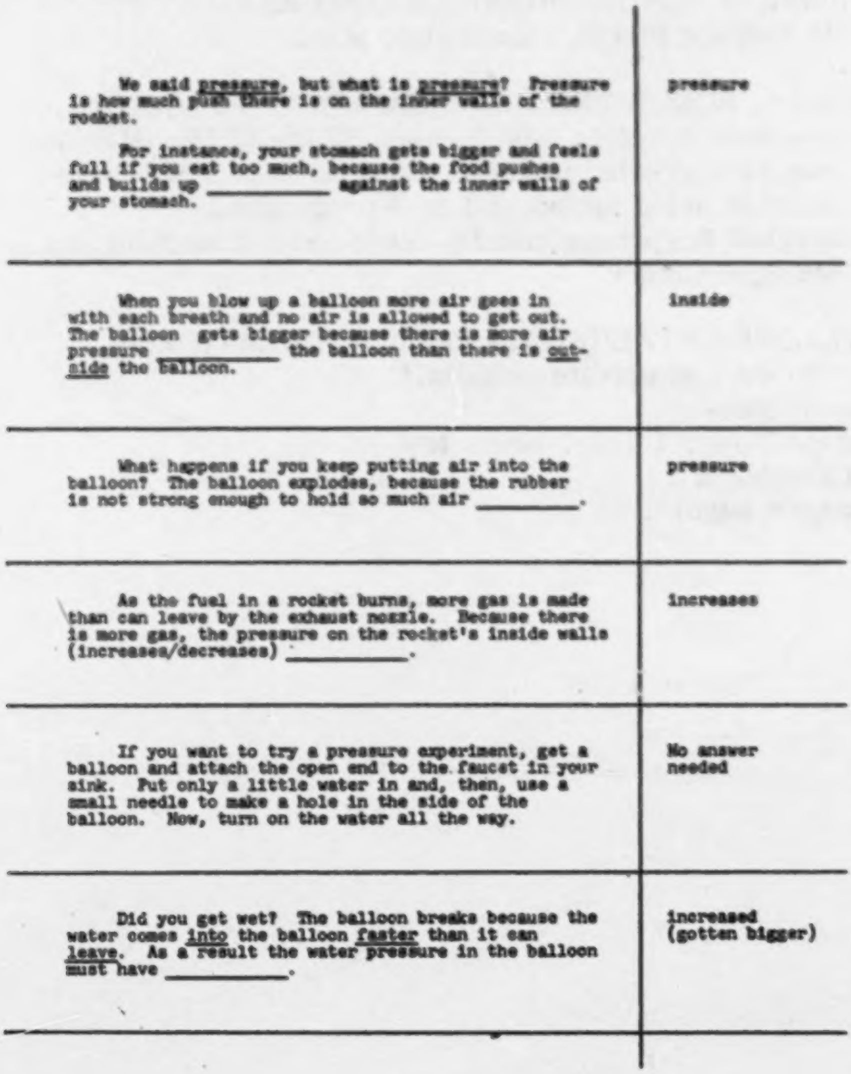
FUNDAMENTALS OF ROCKETS AND SPACE TRAVEL
Introduction to the Space Age
PAUL H. BUCKLEY, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.); program reusable, 200 frames, $2.00-$2.50. (Machine may be marketed in retail channels at this $20 combination price including 3 or 4 programs.)
Constructed Responses usually used; some Branching; no Multiple Choice.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

GENERAL SCIENCE

FUNDAMENTALS OF ROCKETS AND SPACE TRAVEL
Buckley; HONOR PRODUCTS COMPANY
one sample page:



We said pressure, but what is pressure? Pressure is how much push there is on the inner walls of the rocket. For instance, your stomach gets bigger and feels full if you eat too much, because the food pushes and builds up ___________ against the inner walls of your stomach.	pressure
When you blow up a balloon more air goes in with each breath and no air is allowed to get out. The balloon gets bigger because there is more air pressure ___________ the balloon than there is outside the balloon.	inside
What happens if you keep putting air into the balloon? The balloon explodes, because the rubber is not strong enough to hold so much air _________.	pressure
As the fuel in a rocket burns, more gas is made than can leave by the exhaust nozzle. Because there is more gas, the pressure on the rocket's inside walls (increases/decreases) ___________.	increases
If you want to try a pressure experiment, get a balloon and attach the open end to the faucet in your sink. Put only a little water in and, then, use a small needle to make a hole in the side of the balloon. Now, turn on the water all the way.	No answer needed
Did you get wet? The balloon breaks because the water comes into the balloon faster than it can leave. As a result the water pressure in the balloon must have ___________.	increased (gotten bigger)

GENERAL SCIENCE PROGRAMMED LEARNING LABORATORY
Matters in Motion, Flow of Energy, Structure of the Universe, Patterns of Life, Science at Work
JAMES MACRAE
FRANCIS A. EARL
RODRIGO PANARES, all of Accelerated Instruction Methods Corp.
Published by ACCELERATED INSTRUCTION METHODS CORPORATION,
179 North Michigan Avenue, Chicago 17, Illinois.

Programed text, 8500 frames, paperback, 96 pp. per book, 7 1/2" x 9 1/4", available in 20 separate units at $.72 each.
Teacher's Manual available, 1 per book, $.96.
Table of Contents, Index.
Unit Test(s) available, included in Teacher's Manual.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

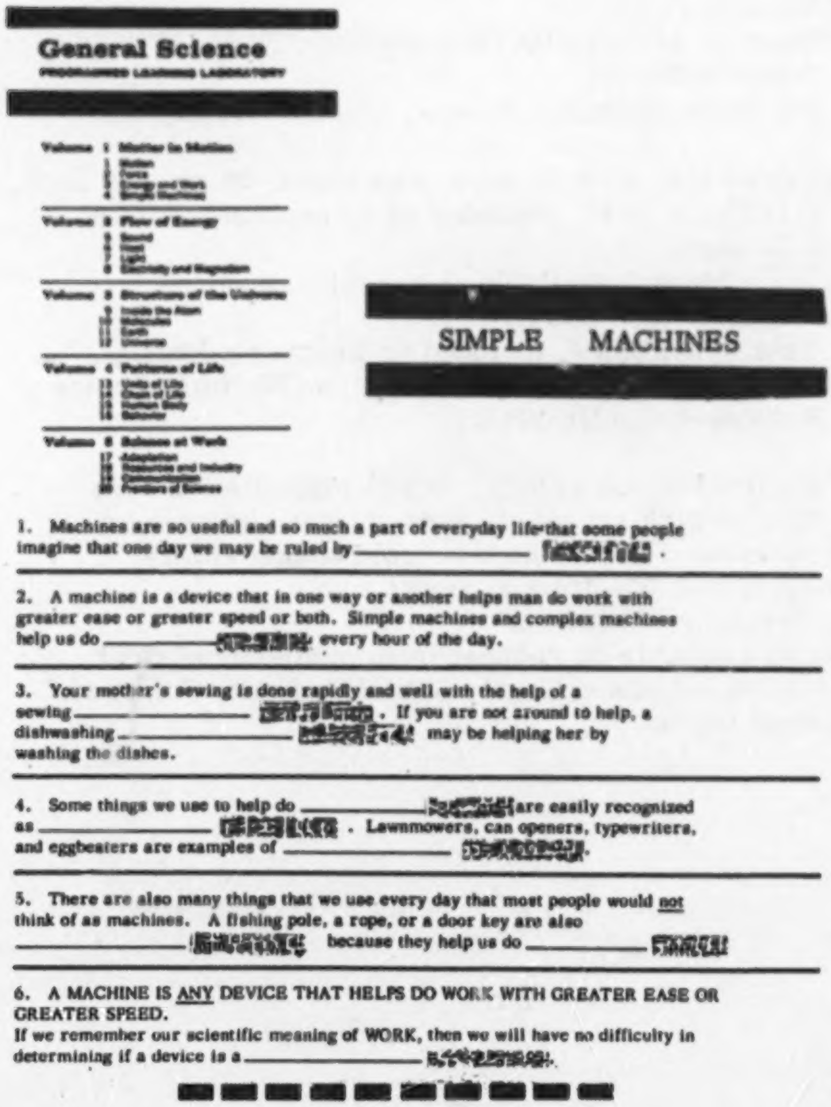
DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Junior high school students, bright sixth graders."
Prerequisites: "Junior high school reading ability."
Average Time: 65-70 hours (est.).
Next Revision: "Unknown."
"Results available on request from publisher of final testing Jefferson County School District, Colorado."
(8 sample pages)

GENERAL SCIENCE

GENERAL SCIENCE PROGRAMMED LEARNING LABORATORY

Macrae, Earl, Panares; ACCELERATED INSTRUCTION METHODS CORPORATION

8 sample pages:



General Science

PROGRAMMED LEARNING LABORATORY

SIMPLE MACHINES

1. Machines are so useful and so much a part of everyday life that some people imagine that one day we may be ruled by ______________ [redacted] .

2. A machine is a device that in one way or another helps man do work with greater ease or greater speed or both. Simple machines and complex machines help us do ______________ [redacted] every hour of the day.

3. Your mother's sewing is done rapidly and well with the help of a sewing ______________ [redacted] . If you are not around to help, a dishwashing ______________ [redacted] may be helping her by washing the dishes.

4. Some things we use to help do ______________ [redacted] are easily recognized as ______________ [redacted] . Lawnmowers, can openers, typewriters, and eggbeaters are examples of ______________ [redacted].

5. There are also many things that we use every day that most people would not think of as machines. A fishing pole, a rope, or a door key are also ______________ [redacted] because they help us do ______________ [redacted]

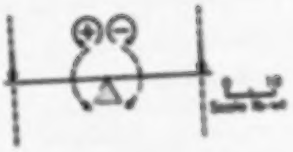
6. A MACHINE IS ANY DEVICE THAT HELPS DO WORK WITH GREATER EASE OR GREATER SPEED.
If we remember our scientific meaning of WORK, then we will have no difficulty in determining if a device is a ______________ [redacted].

395. A counterclockwise torque is a POSITIVE TORQUE.

Physicists and engineers represent it by this symbol: ⊕

A clockwise torque is a NEGATIVE TORQUE.

Physicists and engineers represent it by this symbol: ⊖



The torque of a force may be either
______ [redacted] or
______

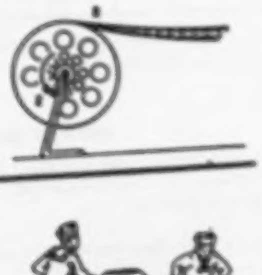
[redacted]

396. The advantage gained with a wheel and axle like this one is *______ [redacted].

A. The resistance moves through a much greater distance than the effort.

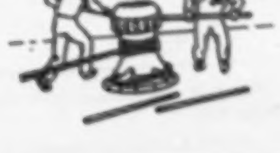
B. The effort force is increased.

*A or B



397. When the effort acts at the circumference of the wheel, the TMA is always *______ _ _ 1.

*<, =, or >



398. The advantage we gain with a wheel and axle like this one is *______ _B_.

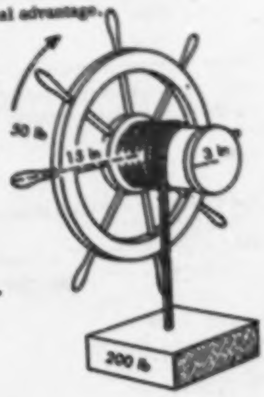
A. The resistance moves through a greater distance than the effort force.
B. The effort force is increased.

*A or B

399. We take friction into account when we calculate actual mechanical advantage. To calculate AMA we use this formula:

$AMA = \frac{F_o}{F_i}$ = $\frac{[redacted]}{[redacted]}$

*effort force or output force



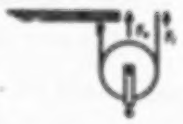
400. An effort force (F_i) of 50 pounds-weight rotates this wheel and axle and slowly raises a 200-pound-weight load. Therefore, its AMA is:

$AMA = \frac{F_o}{F_i} = \frac{200 \text{ pounds-weight}}{50 \text{ pounds-weight}}$ = ______ [redacted]

401. Notice the lengths of r_a and r_w. Although the AMA is 4, the TMA is:

$\frac{r_w}{r_a} = \frac{15 \text{ inches}}{3 \text{ inches}}$ = ______ [redacted]

349. A MOVABLE pulley, unlike a fixed pulley, does move up or down with the resistance as a force is supplied.

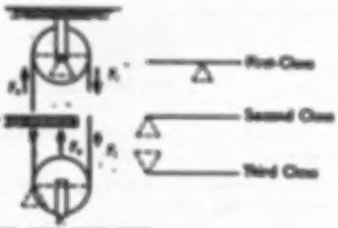


This pulley is a *____________ [redacted] pulley.

*fixed or movable

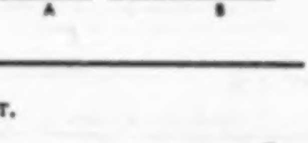
350. A fixed pulley is a modified *__________ [redacted]-class lever.

*first or second



351. A movable pulley is a modified __________ [redacted]-class lever.

418. Suppose you wanted to exert the least amount of effort force to roll a barrel onto a truck.



Which inclined plane would you choose? *_____ [redacted]

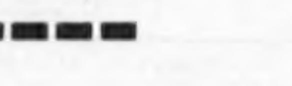
*A or B

419. The TMA of an inclined plane depends upon how steep it is.

Which inclined plane is the steeper? *_____ [redacted]

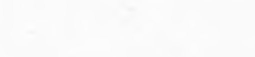
Which inclined plane has the greater TMA? _____ [redacted]

*A or B



420. We calculate the TMA of an inclined plane from its steepness, that is, we compare its LENGTH with its HEIGHT.

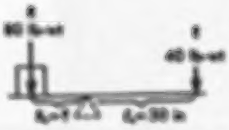
$$\text{TMA} = \frac{\text{LENGTH}}{\text{HEIGHT}}$$



The TMA of this inclined plane is:

$$\text{TMA} = \frac{L}{H} = \frac{12}{2} = \_\_\_\_\_$$ [redacted]

284. The magnitude of the effort force (*E*) that balances the lever is ______ [redacted] pounds-weight.



285. Suppose we know the values of E, E_a, and R and want to find the value of R_a. R_a is the length of the balanced lever's ______ [redacted]

286. To find the value of R_a we write the formula this way:

$$E \times E_a = R \times R_a$$

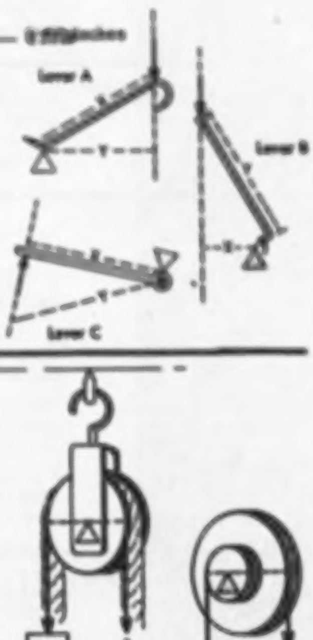
$$R_a = \frac{E \times E_a}{R} = \frac{\text{40 pounds-weight} \times \text{20 inches}}{\text{80 pounds-weight}} = \_\_\_\_\_\_$$ [redacted] inches

287. Suppose we want to measure the torque arms of the forces acting on these levers.

For lever A we measure distance
*______ [redacted]

For lever B we measure distance
*______ [redacted]

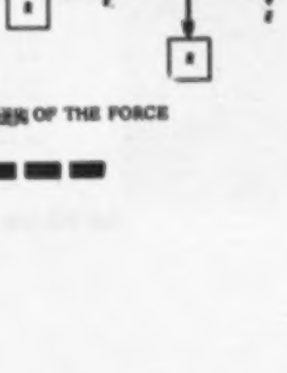
For lever C we measure distance
*______ [redacted]



288. If we draw a straight line through the fulcrum of a pulley, we can see that it is really a modified first-class ______ [redacted]

289. A wheel and axle is also a modified first-class lever.

If we remember that the pulley and the wheel and axle are modified ______ *[redacted], we can easily calculate the torque of forces acting on them.



290. In a pulley or wheel and axle, just as in a lever:

TORQUE = THE ______ [redacted] OF THE FORCE × THE TORQUE ARM OF THE FORCE.

[redacted]

567 Strictly speaking, you could never measure any quantity
at an instant in time.

Before you could start and finish the measurements,
the ______________ in time would no longer be.

---

568 Even in an interval of one second,
there are instants in time.

We can say the tiny interval of a second
contains many, many ______________ in time.

---

569 In practice, the best we can do
to measure speed or velocity at an instant
is to use the tiniest interval possible,
which we know contains that instant in __________ .

---

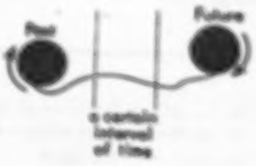
570 Suppose we could
represent time
by two balls of string.

Look at the picture.

The ball winding up
could represent
past time.

The ball unwinding
could represent
______________ time.

A piece of string
could represent an
________________ of time.

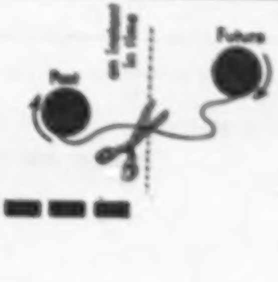


---

571 An interval of time contains
many, many ________________ in time.

---

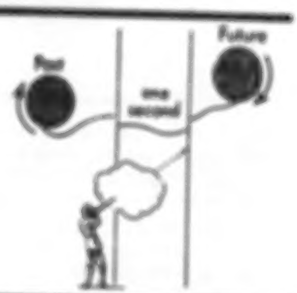
572 We could represent
one of the many, many
________________ that
an interval contains
by any place
we cut the string.



578 Whenever we measure an object's velocity over an interval of time, however tiny the interval may be, we are measuring its ______________ ______________.

---

579 A second is a very short interval of time, but if we measured the speed and direction of a bullet during an ______________ of one second, we would still be measuring its *______________ velocity.

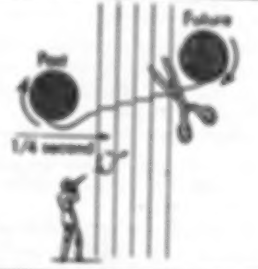

Past
Future
one second

average or instantaneous

---

580 Suppose we kept making the interval shorter and shorter as we measured the bullet's velocity.

We would still be measuring the bullet's ______________ ______________ as we measured its resultant displacement during shorter and shorter ______________ of time.


Past
Future
1/4 second

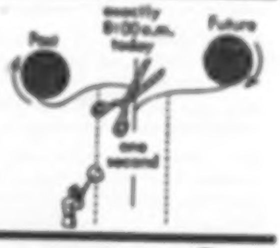
---

581 Look at the picture.

Suppose instant A, at which we wanted to measure a bullet's instantaneous velocity, was exactly 8:00 a.m. today.

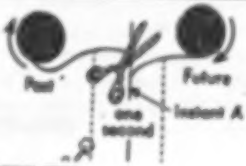
"Exactly 8:00 a.m. today" is an ______________ in time.

* instant or interval


Past
exactly 8:00 a.m. today
Future
one second

---

582 We know instant A can be found in the ______________ of one second that contains 8:00 a.m. today.


Past
Future
one second
instant A

ENERGY AND WORK

CHAPTER 7

---

302. A photographer flashes a flashbulb on Fifth Avenue in New York. In the outer reaches of space a star explodes. Close to us and billions of miles away __________ [redacted] is changing from one form to another.

---

303. The law of ________________ [redacted] of energy tells us that although the energy in the universe may change form many, many times, the total amount of energy in the universe * __________ [redacted] constant.

*is or is not

---

304. A billion years ago the sun was radiating heat energy and light energy.
As far as we know, a billion years in the future the sun will still be radiating
__________ [redacted] energy and __________ [redacted] energy to the earth and the other planets.

---

305. Millions of years ago plants and trees of the earth's prehistoric forests absorbed heat and light energy from the sun and stored some of this energy as potential chemical energy in their cells.
Just as plants do today, these primeval plants transformed __________ [redacted] and __________ [redacted] energy from the sun to ______________ [redacted] chemical energy in their cells.

---

306. The deposits of coal and oil found in the earth today have been formed from layer upon layer of dead plants and animals compressed for millions of years beneath the earth's surface. Today, the potential chemical energy of burning coal and oil is released in the form of __________ [redacted] and light energy, and can be used for doing __________ [redacted]

---

307. Coal and oil can be called FOSSIL FUELS
because they have been preserved beneath the earth's surface for millions of years.
Indirectly, the energy of the gasoline that powers a car came from the sun
* ______________ [redacted] of years ago. Gasoline, too, could therefore be called a __________ [redacted] fuel.

*millions, thousands, or hundreds

---

308. The next time you are at a gas station you might ask the attendant for some fossil fuel. If the attendant is a scientist on a working vacation, he should know that you are asking for
______________ [redacted]

[redacted]

191. To slow down, a falling object must spend some of its kinetic energy by doing ______________ [redacted] on whatever is slowing it down.
To stop, a falling object must spend all its *______________ [redacted] energy by doing ______________ [redacted] on whatever stops it.

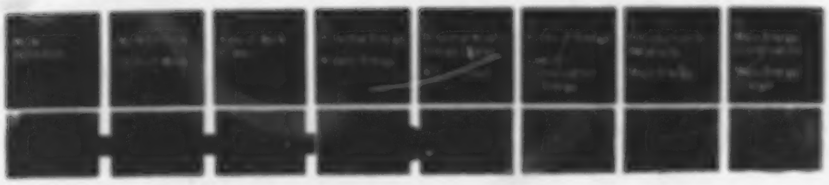
*kinetic or potential

192. A falling rock does ______________ [redacted] as it strikes the ground because it pays ______________ [redacted] to the soil as it pushes the soil in front of itself.

193. Luckily, raindrops have spent nearly all their kinetic energy in overcoming air resistance before they reach the earth.

They have done ______________ [redacted] on the earth's atmosphere on the way down. Otherwise, a raindrop would be traveling with the speed of a bullet, and even a tin roof wouldn't be much of an umbrella!

Professor Atm inspects a racing car's mercury flywheel, used to increase the kinetic energy of the flywheel's rotation once the car is in motion.



GENERAL SCIENCE Jr. H.S.

GENERAL SCIENCE SERIES—BIOLOGY AND CHEMISTRY

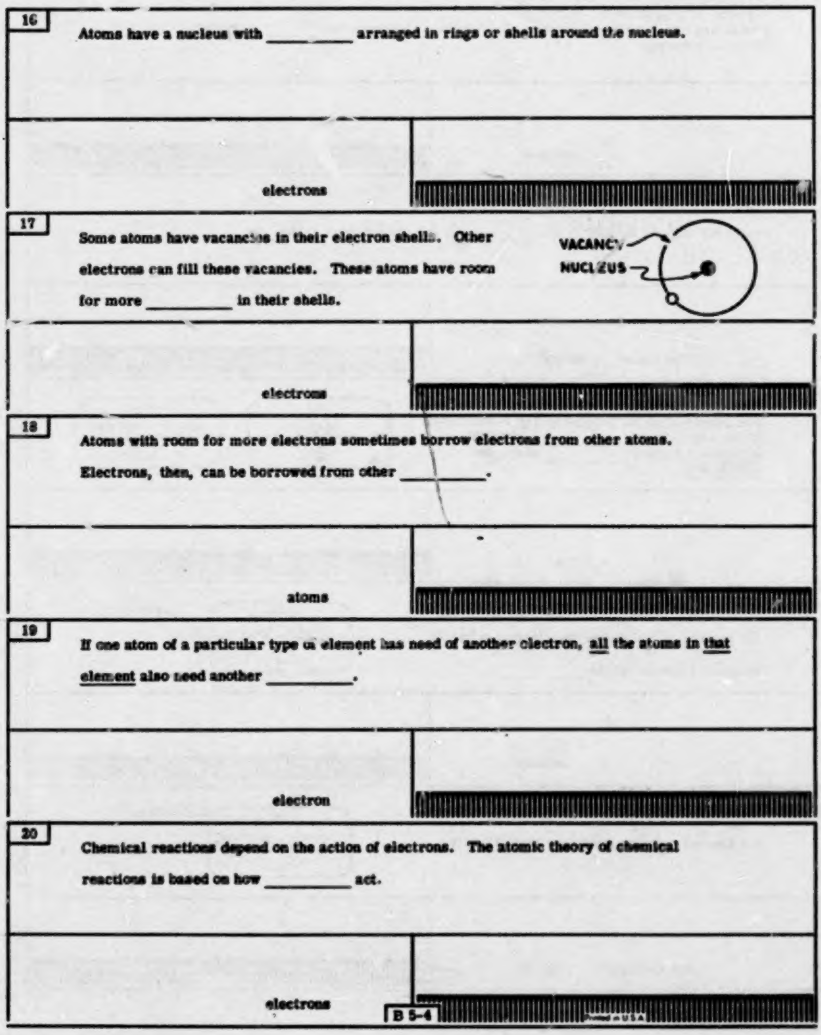
HALMUTH H. SCHAEFER
ARTHUR P. JEFFRIES, both of Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION
575 Lexington Avenue, New York 22, New York

Programed text, 2,113 frames, paperback, 491 pp., 8-1/2" x 11", bound in 2 separate volumes, $13.50.
For use in MIN/MAX II machine, $25.00; program reusable, $12.50.
Teacher's Manual: General Manual for all TMI-Grolier programs available.
Table of Contents.
Final Test included.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Eighth grade students, average age 12 years 8 months. Age range 12-15 years."
Other using population(s): "Review for higher grades."
Prerequisites:
Average Time: 15-25 hours (based entirely on data); standard deviation, 2.29 hours.
Next Revision: March, 1964.
(2 sample pages)

GENERAL SCIENCE

GENERAL SCIENCE SERIES—BIOLOGY AND CHEMISTRY
Schaefer, Jeffries; TEACHING MATERIALS CORPORATION
2 sample pages:



16 Atoms have a nucleus with __________ arranged in rings or shells around the nucleus.

electrons

17 Some atoms have vacancies in their electron shells. Other electrons can fill these vacancies. These atoms have room for more __________ in their shells.

VACANCY
NUCLEUS

electrons

18 Atoms with room for more electrons sometimes borrow electrons from other atoms. Electrons, then, can be borrowed from other __________.

atoms

19 If one atom of a particular type of element has need of another electron, all the atoms in that element also need another __________.

electron

20 Chemical reactions depend on the action of electrons. The atomic theory of chemical reactions is based on how __________ act.

electrons

B 5-4

Printed in U.S.A.

56

Period of growth - interphase stage.
Process of reproduction - mitosis.
There are four stages of mitosis. We have been discussing the __________ which is the first stage of mitosis.

prophase

57

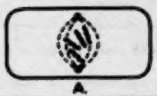
The second stage of mitosis is the metaphase.

The first stage of mitosis is the __________; the second stage is the __________.

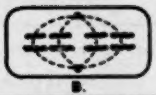
prophase metaphase

58

During the metaphase, the chromosomes arrange themselves along an imaginary line at the center of the cell. Figure __________ shows the prophase. Figure __________ shows the metaphase.



A.

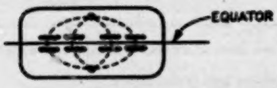


B.

A B

59

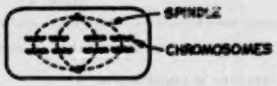
Just as our earth has an imaginary line called the equator, a cell during the metaphase has an imaginary line called the __________.



equator

60

During the metaphase, the __________ arrange themselves along an imaginary line called the __________.



chromosomes equator

A 9-12

GENERAL SCIENCE SERIES: MEASUREMENT, METEOROLOGY & ASTRONOMY
HALMUTH H. SCHAEFER
ARTHUR P. JEFFRIES, both of Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York

Programed text, 1,916 frames, paperback, 450 pp., 8-1/2" x 11", bound in 2 separate volumes, $13.50.
For use in MIN/MAX II machine, $25.00; program reusable, $12.50.
Teacher's Manual: General Manual available for all TMI-Grolier programs.
Table of Contents.
Final Test included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

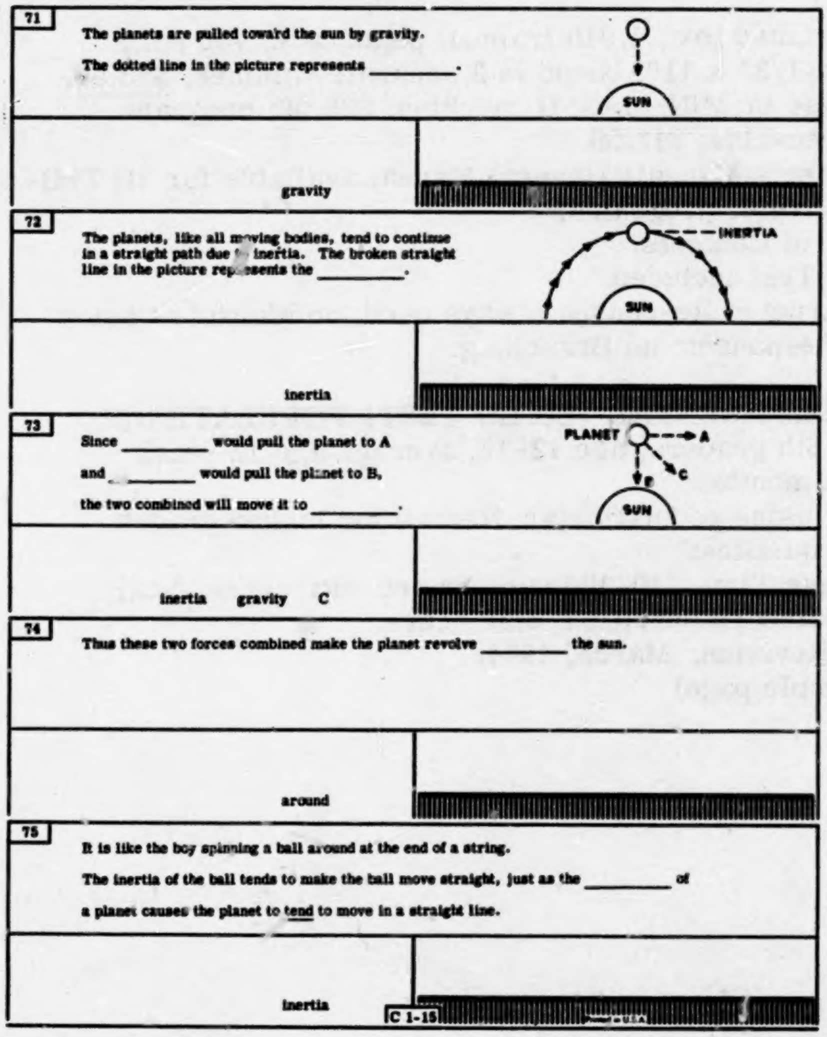
DEVELOPMENTAL (FIELD TEST) POPULATION(S): "8th graders, age 12-15, average age 12 years 6 months."
Other using population(s): Review for higher grades.
Prerequisites:
Average Time: 10-20 hours (based entirely on data); standard deviation, 3.38 hours.
Next Revision: March, 1964.
(1 sample page)

GENERAL SCIENCE

GENERAL SCIENCE SERIES: MEASUREMENT, METEOROLOGY & ASTRONOMY

Schaefer, Jeffries; TEACHING MATERIALS CORPORATION

one sample page:



71

The planets are pulled toward the sun by gravity.

The dotted line in the picture represents ________.

SUN

gravity

72

The planets, like all moving bodies, tend to continue in a straight path due to inertia. The broken straight line in the picture represents the ________.

INERTIA
SUN

inertia

73

Since ________ would pull the planet to A

and ________ would pull the planet to B,

the two combined will move it to ________.

PLANET
A
B
C
SUN

inertia gravity C

74

Thus these two forces combined make the planet revolve ________ the sun.

around

75

It is like the boy spinning a ball around at the end of a string.

The inertia of the ball tends to make the ball move straight, just as the ________ of a planet causes the planet to tend to move in a straight line.

inertia

C 1-15

Printed in U.S.A.

GENERAL SCIENCE SERIES—SOUND, LIGHT, ELECTRICITY AND COMMUNICATIONS
HALMUTH H. SCHAEFER
ARTHUR P. JEFFRIES, both of Teaching Materials Corp.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, New York

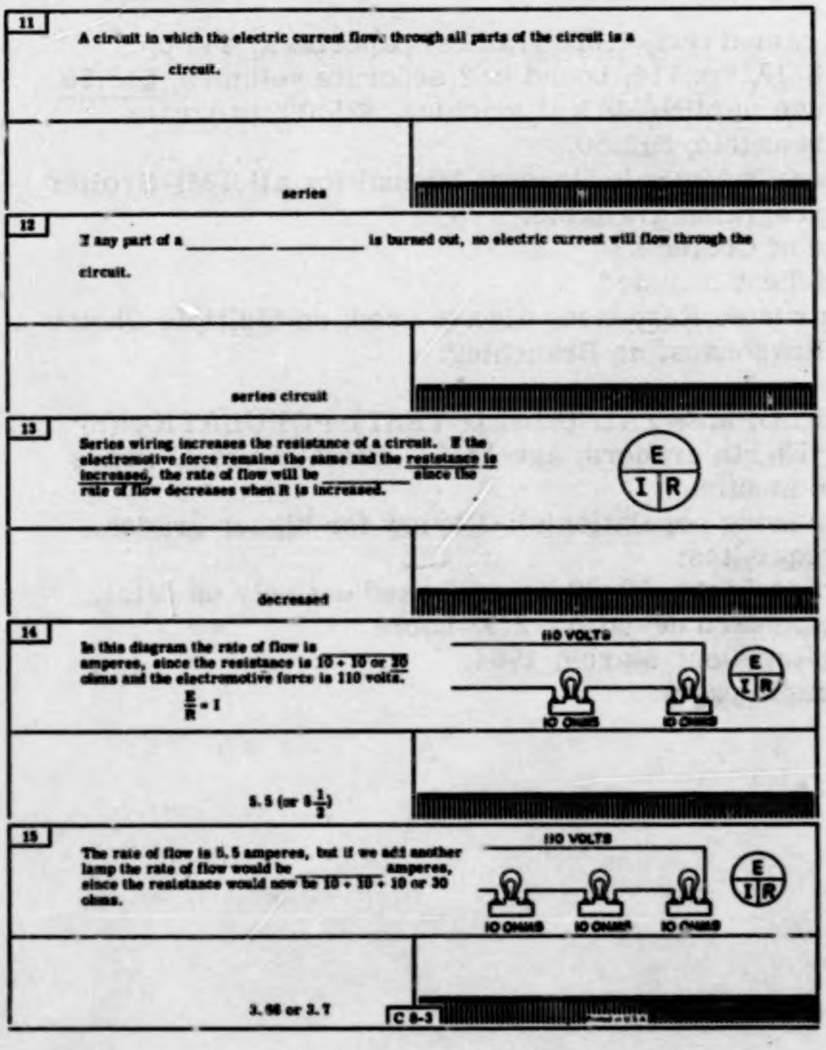
Programed text, 1,823 frames, paperback, 445 pp., 8-1/2" x 11", bound in 2 separate volumes, $13.50.
For use in MIN/MAX II machine, $25.00; program reusable, $12.50.
Teacher's Manual: General Manual for all TMI-Grolier programs available.
Table of Contents.
Final Test included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Eighth graders, age 12-15, average age 12 years 6 months."
Other using population(s): Review for higher grades.
Prerequisites:
Average Time: 10-20 hours (based entirely on data); standard deviation, 2.93 hours.
Next Revision: March, 1964.
(1 sample page)

GENERAL SCIENCE SERIES—SOUND, LIGHT, ELECTRICITY AND COMMUNICATIONS

Schaefer, Jeffries; TEACHING MATERIALS CORPORATION

one sample page:



11

A circuit in which the electric current flows through all parts of the circuit is a

__________ circuit.

series

12

If any part of a __________ __________ is burned out, no electric current will flow through the circuit.

series circuit

13

Series wiring increases the resistance of a circuit. If the electromotive force remains the same and the resistance is increased, the rate of flow will be __________ since the rate of flow decreases when R is increased.

decreased

14

In this diagram the rate of flow is __________ amperes, since the resistance is 10 + 10 or 20 ohms and the electromotive force is 110 volts.

$\frac{E}{R} = I$

5.5 (or $5\frac{1}{2}$)

15

The rate of flow is 5.5 amperes, but if we add another lamp the rate of flow would be __________ amperes, since the resistance would now be 10 + 10 + 10 or 30 ohms.

3.66 or 3.7

C 8-3

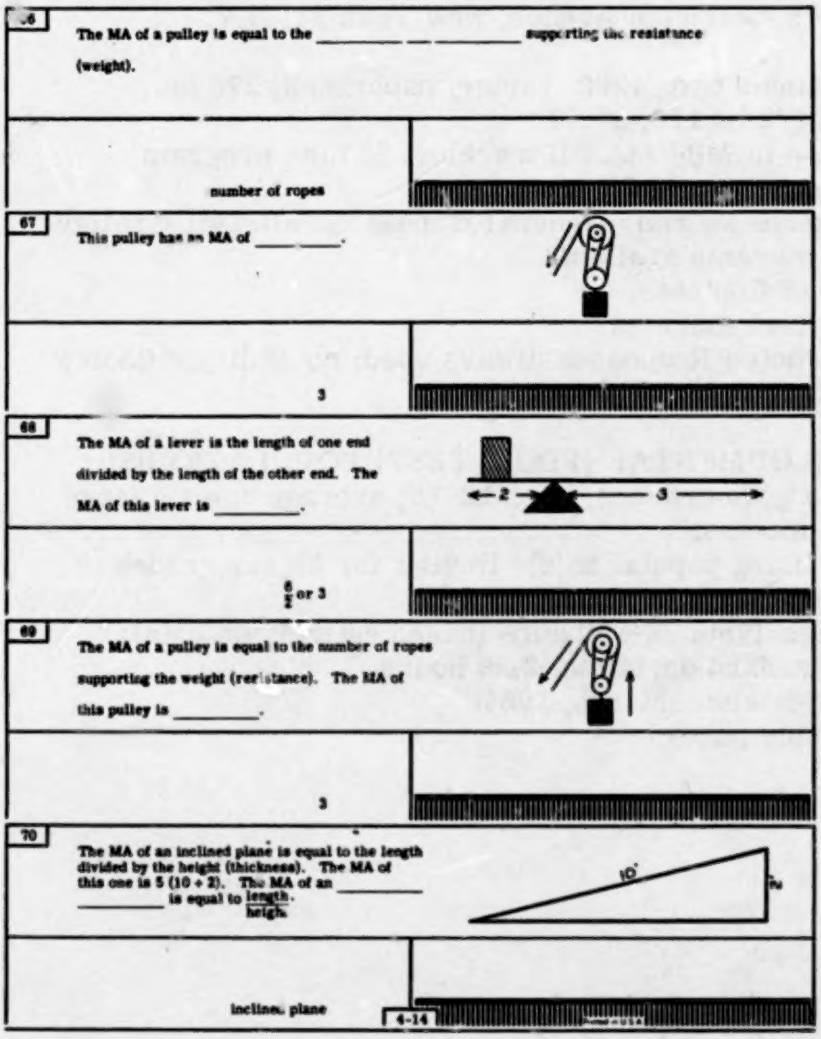
GENERAL SCIENCE SERIES: WORK AND MACHINES
HALMUTH H. SCHAEFER
ARTHUR P. JEFFRIES, both of Teaching Materials Corporation
Published by TEACHING MATERIALS CORPORATION, 575 Lexington Avenue, New York 22, N.Y.

Programed text, 1200 frames, paperback, 278 pp., 8 1/2" x 11", $8.50.
For use in MIN/MAX II machine, $25.00; program reusable, $7.50.
Teacher's Manual: General manual for all TMI-Grolier programs available.
Table of Contents.
Final Test included.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Eighth graders, ages 12-15, average age 12 years 8 months."
Other using population(s): Review for higher grades.
Prerequisites:
Average Time: 8-15 hours (based entirely on data); standard deviation, 2.29 hours.
Next Revision: March, 1964.
(1 sample page)

GENERAL SCIENCE

GENERAL SCIENCE SERIES: WORK AND MACHINES
Schaefer, Jeffries; TEACHING MATERIALS CORPORATION
one sample page:



66 The MA of a pulley is equal to the ________ __ ________ supporting the resistance (weight).

number of ropes

67 This pulley has an MA of ________.

3

68 The MA of a lever is the length of one end divided by the length of the other end. The MA of this lever is ________.

$\frac{6}{2}$ or 3

69 The MA of a pulley is equal to the number of ropes supporting the weight (resistance). The MA of this pulley is ________.

3

70 The MA of an inclined plane is equal to the length divided by the height (thickness). The MA of this one is 5 (10 ÷ 2). The MA of an ________ ________ is equal to $\frac{\text{length}}{\text{heigh}}$.

inclined plane

4-14

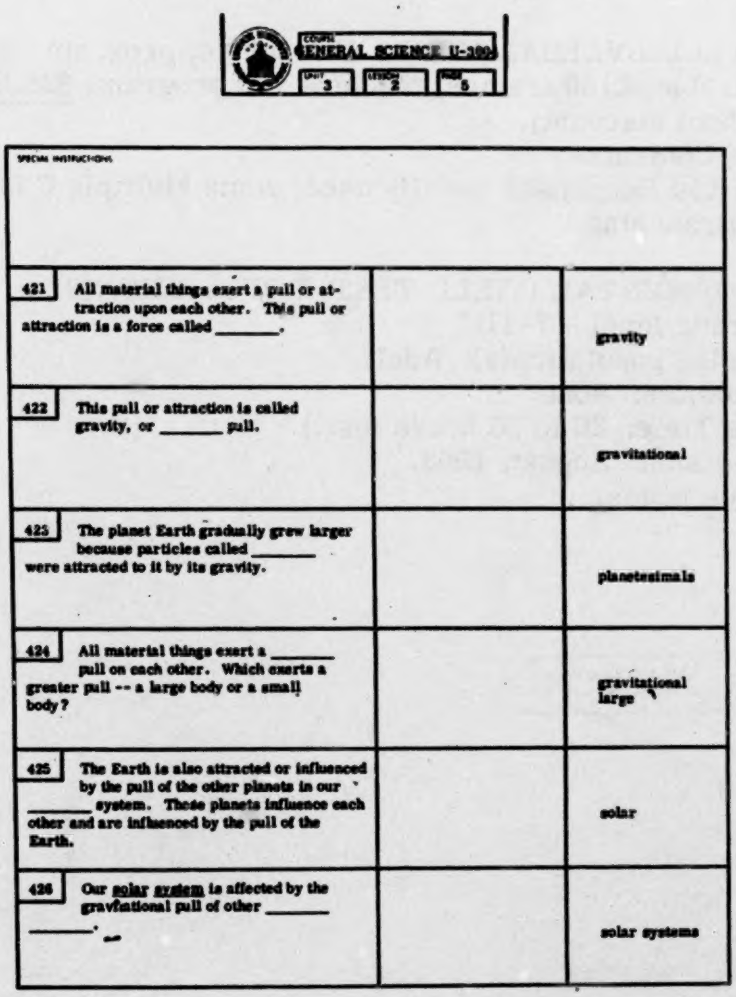
GENERAL SCIENCE U-3004
UNIVERSAL ELECTRONICS LABORATORIES CORPORATION
Published by UNIVERSAL TEACHING MACHINE INSTITUTE,
510 Hudson Street, Hackensack, New Jersey

For use in UNIVERSAL MODEL U machine, program reusable, 2160 frames, machine and program, $25.00 (school discount).
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Grade level - 7-11."
Other using population(s): Adult.
Prerequisites: None.
Average Time: 30 to 36 hours (est.).
Next Revision: August, 1963.
(2 sample pages)

GENERAL SCIENCE

GENERAL SCIENCE U-3004
Universal Electronics Laboratories Corporation; UNIVERSAL TEACHING MACHINE INSTITUTE
2 sample pages:



COURSE GENERAL SCIENCE U-300
UNIT 3 LESSON 2 PAGE 5

SPECIAL INSTRUCTIONS

421 All material things exert a pull or attraction upon each other. This pull or attraction is a force called _______.		gravity
422 This pull or attraction is called gravity, or _______ pull.		gravitational
423 The planet Earth gradually grew larger because particles called _______ were attracted to it by its gravity.		planetesimals
424 All material things exert a _______ pull on each other. Which exerts a greater pull -- a large body or a small body?		gravitational large
425 The Earth is also attracted or influenced by the pull of the other planets in our _______ system. These planets influence each other and are influenced by the pull of the Earth.		solar
426 Our solar system is affected by the gravitational pull of other _______ _______.		solar systems

GENERAL SCIENCE U-300

3 4 2

475 The gravitational pull of the ________ is only one-sixth that of the earth's pull.		**moon**
476 This means that if you weigh 180 pounds on the Earth you would weigh one-sixth of that, or ________ pounds on the moon.		**30**
477 If you jumped two feet on the Earth, the same energy would carry you ________ feet on the moon.		**12**
478 The pull or force which is being compared between the Earth and the moon is called the ________ pull, or the pull of gravity.		**gravitational**
479 When we look at the moon through a telescope, the surface of the moon is magnified and can be clearly seen.	**GO TO NEXT FRAME**	
480 Looking at the moon through a ________, which magnifies it, we can see rough and smooth areas on the surface of the moon.		**telescope**

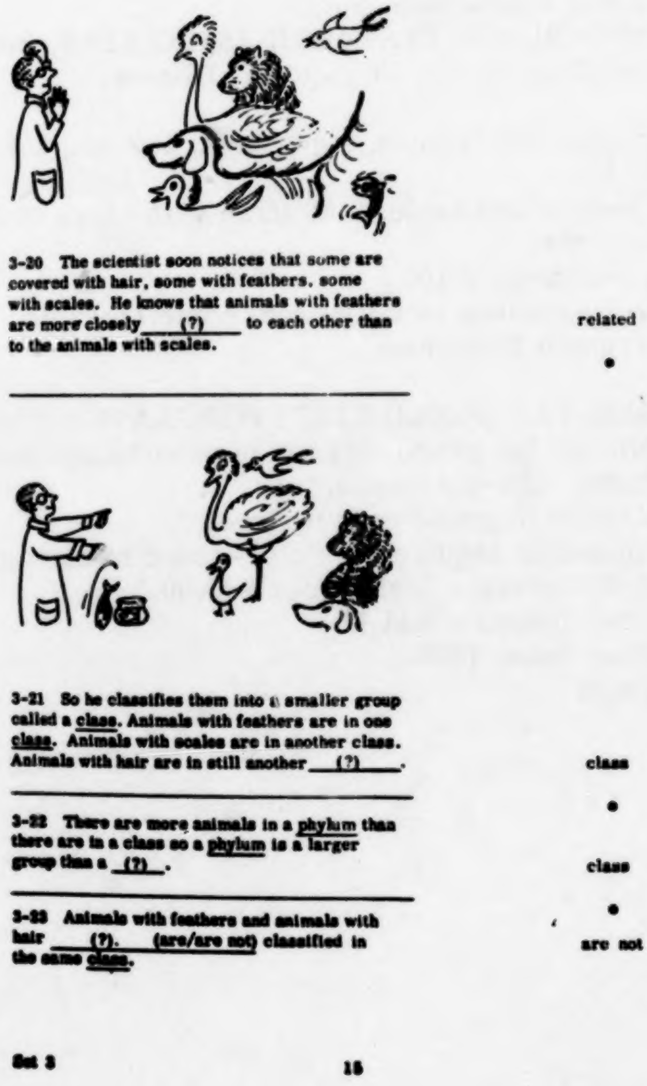
GROUPING ANIMALS: WHAT IS A MAMMAL?
FRANCES UNGER MEADE, Programer, Learning Incorporated.
Published by CORONET INSTRUCTIONAL FILMS, 65 E. So. Water Street, Chicago 1, Illinois.

Programed text, 321 frames, paperback, 57 pp., 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "...Small representative samplings at appropriate grade levels tested informally on one-to-one basis with programer. Small representative samplings under controlled conditions (Dukane Redi-tutor using 35 mm. film) for each revision of program. Program has been through 4 complete revisions, each revision based on data obtained from formal machine testing. Field testing in progress: Classroom testing from 4th through 7th grades, administered by classroom teachers. Test areas distributed geographically from Florida to California. All testing conducted by Learning Incorporated."
Prerequisites: Grade 4 reading level.
Average Time: 2 hours, 36 minutes (based entirely on data); standard deviation, 31.1 minutes.
Next Revision: "The published program is the final revision."
(1 sample page)

GENERAL SCIENCE

GROUPING ANIMALS: WHAT IS A MAMMAL?
Meade; CORONET INSTRUCTIONAL FILMS
one sample page:



3-20 The scientist soon notices that some are covered with hair, some with feathers, some with scales. He knows that animals with feathers are more closely ____(?)____ to each other than to the animals with scales.	related
	●
3-21 So he classifies them into a smaller group called a class. Animals with feathers are in one class. Animals with scales are in another class. Animals with hair are in still another ____(?)____.	class
	●
3-22 There are more animals in a phylum than there are in a class so a phylum is a larger group than a __(?)__.	class
	●
3-23 Animals with feathers and animals with hair ____(?). (are/are not) classified in the same class.	are not

Set 3 15

HOW TO USE THE MICROSCOPE
SETH WOHL
DAVID R. BELASH
LEWIS D. EIGEN
BERTRAM M. SIEGEL, Programers, The Center for Programed Instruction, Inc.
Published by SCIENCE RESEARCH ASSOCIATES, Inc., 259 East Erie Street, Chicago 11, Illinois.

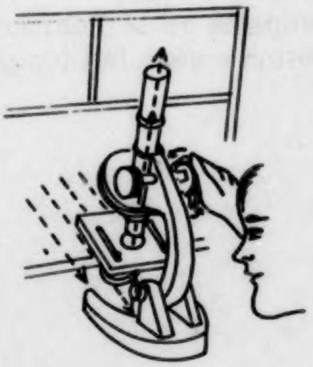
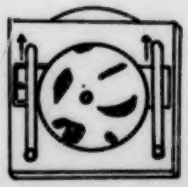
Programed text, 450 frames, paperback, 169 pp., 8 1/2" x 11", $2.50.
Teacher's Manual available, $.50 (free with class orders).
Table of Contents.
Final Test available, $.10.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "4th, 5th and 6th grade classes in suburban schools. I.Q. slightly above average."
Prerequisites: "5th grade reading level."
Additional material required: "Color-coded microscope and set of 7 slides. List price: $45.00."
Average Time: 8 hours (est.).
Next Revision: June, 1965.
(1 sample page)

HOW TO USE THE MICROSCOPE

Wohl, Belash, Eigen, Siegel; SCIENCE RESEARCH ASSOCIATES

one sample page:

low power lens 18-2	STEP 3. Turn the light control ring until the largest hole is clicked into place under the center of the stage. When you have done this, you can see (How many?) ☐ yellow dots on the edge of the light control ring. 18-3
hole 18-10	 STEP 11. Put your head down to one side, and turn the ☐ ☐ ☐ so that the low power lens moves (Which way?) ☐. 18-11
C If you chose the wrong answer, go on to the next frame. If you chose the correct answer, skip the next 2 frames and go on to Frame 19-1. 18-18	 Slowly move the slide toward the FRONT of the stage. Do this while looking through the microscope. Through the microscope, the diatoms seem to be moving toward the ☐ of the stage. 18-19

GENERAL SCIENCE Elem.

HOW WE FORECAST THE WEATHER
SHEILA LEVINSKY, Programer , Learning Incorporated.
Published by CORONET INSTRUCTIONAL FILMS,
65 E. So. Water Street, Chicago 1, Illinois.

Programed text, 300 frames, paperback, 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Data incomplete as of February 8, 1963."
Prerequisites: Grade 5 reading level.
Average Time: "Data incomplete as of February 8, 1963."
Next Revision: "Final revision scheduled for publication in Summer, 1963."
(1 sample page)

GENERAL SCIENCE

HOW WE FORECAST THE WEATHER
Levinsky; CORONET INSTRUCTIONAL FILMS
one sample page:

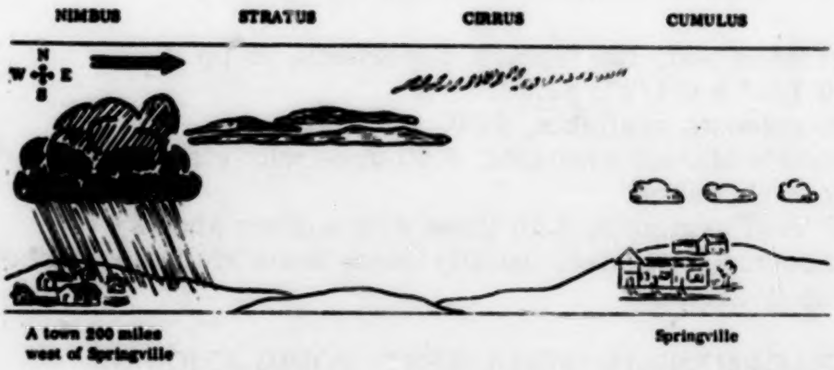


Figure 1

4-16 Figure 1 is a diagram of the sky above two towns. Over Springville, fluffy ________ clouds are floating, but over the other town it is ______ing.	cumulus; raining
	•
4-17 Refer to Figure 1 for the next four frames. Clouds move with the wind. The arrow in the diagram shows that the clouds are moving from ________ to ________ (what directions?).	west; east
	•
4-18 After the cumulus clouds pass over Springville, the cirrus clouds will move overhead. After the cirrus clouds, will come the ________ clouds.	stratus
	•
4-19 After the stratus clouds will come the ________ clouds, and then Springville will have rain.	nimbus
	•
4-20 The clouds usually move across the sky in the order shown in the diagram--first cumulus, then ________, then ________, then nimbus.	cirrus; stratus

GENERAL SCIENCE Jr. H.S.

INTRODUCTION TO NUCLEAR ENERGY
BERTRAM M. SIEGEL
DAVID BELASH
LEWIS D. EIGEN
SETH WOHL, Programers, The Center for Programed Instruction, Inc.
Published by SCIENCE RESEARCH ASSOCIATES, Inc., 259 East Erie Street, Chicago 11, Illinois.

Programed text, 190 frames, paperback, 48 pp., 9 1/2" x 6 1/2", $1.00.
Answer Sheets available, $.39.
Teacher's Manual available, $.50 (free with class orders).
Table of Contents.
Final Test available, $.10 (free with answer sheets).
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Slightly above average 5th and 6th grade classes."
Other using population(s): "4th and 5th grade enrichment classes."
Prerequisites: "5th grade reading level; knowledge of concepts of matter and atomic structure."
Average Time: 2 hours (est.).
Next Revision: June, 1965.
(1 sample page)

GENERAL SCIENCE

INTRODUCTION TO NUCLEAR ENERGY
Siegel, Belash, Eigen, Wohl; SCIENCE RESEARCH ASSOCIATES
one sample page:

6. All uranium atoms have an atomic number of 92, but may have mass numbers of 234, 235, or 238.
In any one element, the atoms may have different ☐ ☐
but they all have the same ☐ ☐

12. The symbols $_{38}Sr^{90}$ and $_{38}Sr^{88}$ stand for different ☐ of the element strontium.

99. An isotope that gives off particles of itself is called a radioactive isotope.
$_{92}U^{238}$ is a ☐ isotope of uranium.

132. The alpha particle has an atomic weight of 4.
It is made up of two protons and two (electrons or neutrons) ☐

179. When a uranium atom absorbs a neutron, ☐ is released and other ☐ are formed.

INTRODUCTION TO THE UNIVERSE
The Solar System and its Neighbors
WILLIAM L. EARLEY, Consultant Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.); program reusable, 200 frames, $2.00-$2.50. (Machine may be marketed in retail channels at this $20 combination price including 3 or 4 programs.)
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page

GENERAL SCIENCE

INTRODUCTION TO THE UNIVERSE
Earley; HONOR PRODUCTS COMPANY
one sample page:

Although this completes the list of known planets, which are now __________ in number, it is far from the complete list of heavenly bodies that comprise our solar system. We have, in fact, already discussed three types of heavenly bodies: the sun, the planets, and the moons that are satellites of the planets.	nine
In addition to the nine major solar satellites, or planets, there are thousands of smaller ones that revolve around the sun. These smaller __________ of the sun are like tiny planets and are called planetoids, or asteriods.	satellites
You recall that there was a great distance in space between the orbits of Mars and Jupiter. At one time, astronomers believed there might be another large __________ in this space gap. Instead, they discovered thousands of very small bodies called planetoids, or asteroids.	planet
The asteroids, or planetoids, range in size from 15 miles to 480 miles in diameter. They are very irregular in shape and have extremely rough surfaces. Most of these tiny satellites, or __________, cannot be seen by the unaided eye.	asteroids (planetoids)
Most of the asteroids are held in their particular pattern or orbit because they are attracted in two directions by the magnetic pull of both the sun and Jupiter. This force of attraction is called __________.	gravity
There are two theories that explain the existence of these asteroids. One theory claims that asteroids are the remnants of an old exploded planet. The other theory is that each planet was originally formed when many similar small bodies joined together, but that these have never formed into a single mass. In other words, astronomers cannot agree on whether the asteroids are parts of an old or a new ______________.	planet

LATITUDE AND LONGITUDE

DARLENE HARING, Programer, Learning Incorporated
LLOYD L. HARING, Dept. of Geography, Arizona State University
Published by CORONET INSTRUCTIONAL FILMS,
65 E. So. Water Street, Chicago 1, Illinois.

Programed text, 380 frames, paperback, 75 pp., 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

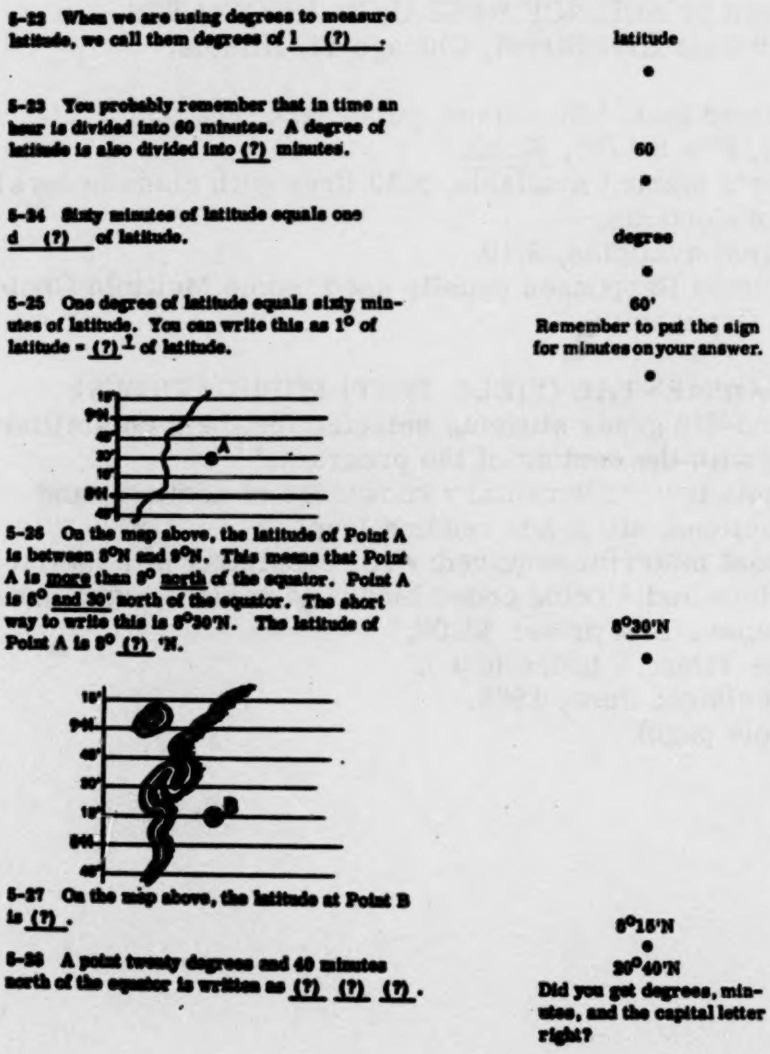
DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"...Small representative samplings at appropriate grade levels tested informally on one-to-one basis with programer. Small representative samplings under controlled conditions (Dukane Redi-tutor using 35 mm. film) for each revision of program. Program has been through 5 complete revisions, each revision based on data obtained from formal machine testing. Field testing in progress: Classroom testing from 5th through 7th grades, administered by classroom teachers. Test areas distributed geographically from Florida to California. All testing conducted by Learning Incorporated."
Prerequisites: Grade 6 reading level.
Average Time: 3 hours, 38 minutes (based entirely on data); standard deviation, 31.5 minutes.
Next Revision: "The published program is the final revision."
(1 sample page)

GENERAL SCIENCE

LATITUDE AND LONGITUDE

D. Haring, L.L. Haring; CORONET INSTRUCTIONAL FILMS

one sample page:


15'
9°N
45'
30'
15'
8°N
45'
A
B

5-22 When we are using degrees to measure latitude, we call them degrees of l (?) .	latitude ●
5-23 You probably remember that in time an hour is divided into 60 minutes. A degree of latitude is also divided into (?) minutes.	60 ●
5-24 Sixty minutes of latitude equals one d (?) of latitude.	degree ●
5-25 One degree of latitude equals sixty minutes of latitude. You can write this as 1° of latitude = (?)' of latitude.	60' Remember to put the sign for minutes on your answer. ●
5-26 On the map above, the latitude of Point A is between 8°N and 9°N. This means that Point A is more than 8° north of the equator. Point A is 8° and 30' north of the equator. The short way to write this is 8°30'N. The latitude of Point A is 8° (?) 'N.	8°30'N ●
5-27 On the map above, the latitude at Point B is (?) .	8°15'N ●
5-28 A point twenty degrees and 40 minutes north of the equator is written as (?) (?) (?) .	20°40'N Did you get degrees, minutes, and the capital letter right?

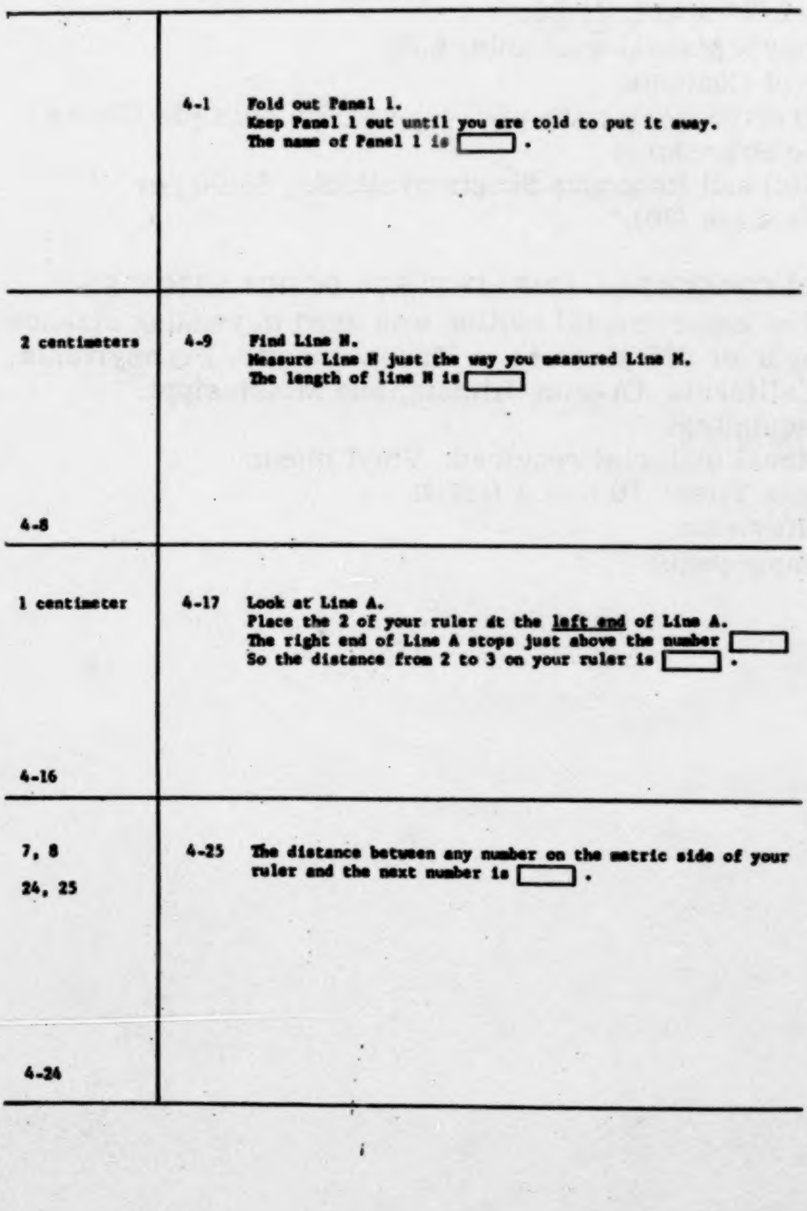
MEASURING LENGTH IN METRIC UNITS
DAVID BELASH
SETH WOHL
LEWIS D. EIGEN
BERTRAM M. SIEGEL, Programers, The Center for Programed Instruction, Inc.
Published by SCIENCE RESEARCH ASSOCIATES, Inc., 259 East Erie Street, Chicago 11, Illinois.

Programed text, 475 frames, paperback, 120 pp., 6 1/2" x 9 1/2", $2.50.
Teacher's Manual available, $.50 (free with class orders).
Table of Contents.
Final Test available, $.10.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "3rd-6th grade students selected for their unfamiliarity with the content of the program."
Prerequisites: "Elementary knowledge of addition, and fractions, 4th grade reading level."
Additional material required: "Kit consisting of 3 metric rulers and 4 color coded blocks of various sizes and shapes. List price: $1.00."
Average Time: 7 hours (est.).
Next Revision: June, 1965.
(1 sample page)

GENERAL SCIENCE

MEASURING LENGTH IN METRIC UNITS
Belash, Wohl, Eigen, Siegel; SCIENCE RESEARCH ASSOCIATES
one sample page:



	4-1	Fold out Panel 1. Keep Panel 1 out until you are told to put it away. The name of Panel 1 is ☐ .
2 centimeters 4-8	4-9	Find Line N. Measure Line N just the way you measured Line M. The length of line N is ☐
1 centimeter 4-16	4-17	Look at Line A. Place the 2 of your ruler at the left end of Line A. The right end of Line A stops just above the number ☐ So the distance from 2 to 3 on your ruler is ☐ .
7, 8 24, 25 4-24	4-25	The distance between any number on the metric side of your ruler and the next number is ☐ .

A PROGRAM ON EARTH-SUN RELATIONS
ROBERT N. SAVELAND, Ginn & Co.
Published by GINN AND COMPANY,
Statler Building, Boston 17, Mass., P.O. 191.

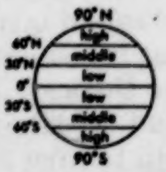
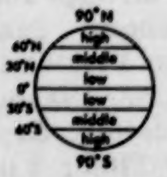
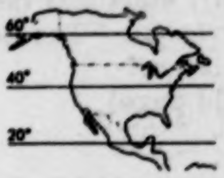
Programed text, 250 frames, paperback, 5 pages, 8 1/2" x 11", $1.00.
Teacher's Manual available, $.28
Table of Contents
Constructed Responses always used; no Multiple Choice; no Branching.
"Test(s) and Response Sheets available, $3.00 per package (36)."

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
The experimental edition was used in regular classes by over 595 students in Massachusetts, Pennsylvania, California, Oregon, Illinois, and Mississippi.
Prerequisites:
Additional material required: Vinyl mask.
Average Time: 10 hours (est.).
Next Revision:
(1 sample page)

GENERAL SCIENCE

A PROGRAM ON EARTH-SUN RELATIONS
Saveland; GINN AND COMPANY
one sample page:

SET 4

equator	4-16. The latitude of the Tropic of Cancer is 23½° N. Since the Tropic of Capricorn is a similar distance south of the equator, its latitude would be ____° __.
23½° South	4-17. The Arctic Circle is 66½° north of the equator. What is the latitude of the Antarctic Circle?
66½° South	4-18. It is sometimes convenient to refer to parts of the world as being in the low, middle, or high latitudes. These broad belts are shown in the accompanying diagram. You can see that the low latitudes extend to ____ degrees on each side of the equator.  90°N high 60°N middle 30°N low 0° low 30°S middle 60°S high 90°S
thirty or 30	4-19. The high latitudes are those which are more than ____ degrees from the equator.  90°N high 60°N middle 30°N low 0° low 30°S middle 60°S high 90°S
sixty or 60	4-20. The United States is mainly in the ____ latitudes. 

Page 21

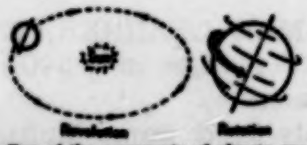
OUR SOLAR SYSTEM
DONNA M. PERSON, Programer, Learning, Incorporated
THEODORE W. MUNCH, Dept. of Science Education,
Arizona State University
Published by CORONET INSTRUCTIONAL FILMS,
65 E. So. Water Street, Chicago 1, Illinois

Programed text, 361 frames, paperback, 66 pp., 7" x 10"
$1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Small representative samplings at appropriate grade levels tested informally on one-to-one basis with programer. Small representative samplings under controlled conditions (Dukane Redi-tutor using 35mm. film) for each revision of program. Program has been through 5 complete revisions, each revision based on data obtained from formal machine testing. Field testing in progress: Classroom testing from 6th through 10th grades, administered by classroom teachers. Test areas distributed geographically from Florida to California. All testing conducted by Learning Incorporated."
Prerequisites: Grade 7 reading level.
Average Time: 2 hours, 2 minutes (based entirely on data); standard deviation, 12.7 minutes.
Next Revision: "The published program is the final revision."
(1 sample page)

GENERAL SCIENCE

OUR SOLAR SYSTEM
Person, Munch; CORONET INSTRUCTIONAL FILMS
one sample page:



5-12 Two of the movements of planets are rotation and revolution. A planet in our solar system moves around the sun in the movement called __(?)__.

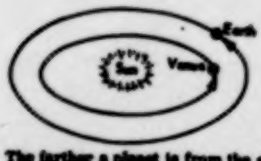
revolution

●

5-13 The revolution of a planet is its movement around the __(?)__.

sun

●



5-14 The farther a planet is from the sun the longer it takes the planet to make one complete trip around the sun. It takes __(?)__ longer to revolve around the sun than __(?)__.

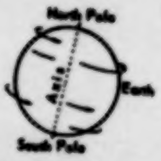
earth;
Venus

●

5-15 The time that it takes the earth to make one revolution around the sun is called a year. This length of time is about __(?)__ days.

365

●



5-16. Earth makes a movement called rotation as it turns or spins on its __(?)__ once every 24 hours.

axis

SCIENCE I and II
HARVEY POLLACK, High school Science Coordinator, Queens, N. Y.
ALEXANDER SCHURE, President, N. Y. Institute of Technology
Published by CENTRAL SCIENTIFIC Company, 1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95; program not reusable, 500 frames in I, 500 in II, I or II included in price of machine.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Over 200."
Prerequisites: None
Average Time: 3 hours (est.)
Next Revision: "Now available."
(1 sample page)

GENERAL SCIENCE

SCIENCE I and II
Pollack, Schure; CENTRAL SCIENTIFIC CO.
one sample page:

SCIENCE II

3. A block of iron resting on a floor exerts a force downward on the floor. This force is due only to the _______ of the block of iron.

. . . .

weight

4. Your muscles can exert force. When you chin yourself on a chinning bar, your muscles exert a pull. If you pull hard enough, the __________ exerted by your muscles will list you from the floor.

. . . .

force

5. Although your weight is not a great enough force to push you through the floor, the force is still present. On the other hand, your muscular force was large enough to move you off hte floor when you chinned. Thus, whether or not the push or pull causes a body to _________ from one place to another, it is still a force.

. . . .

move

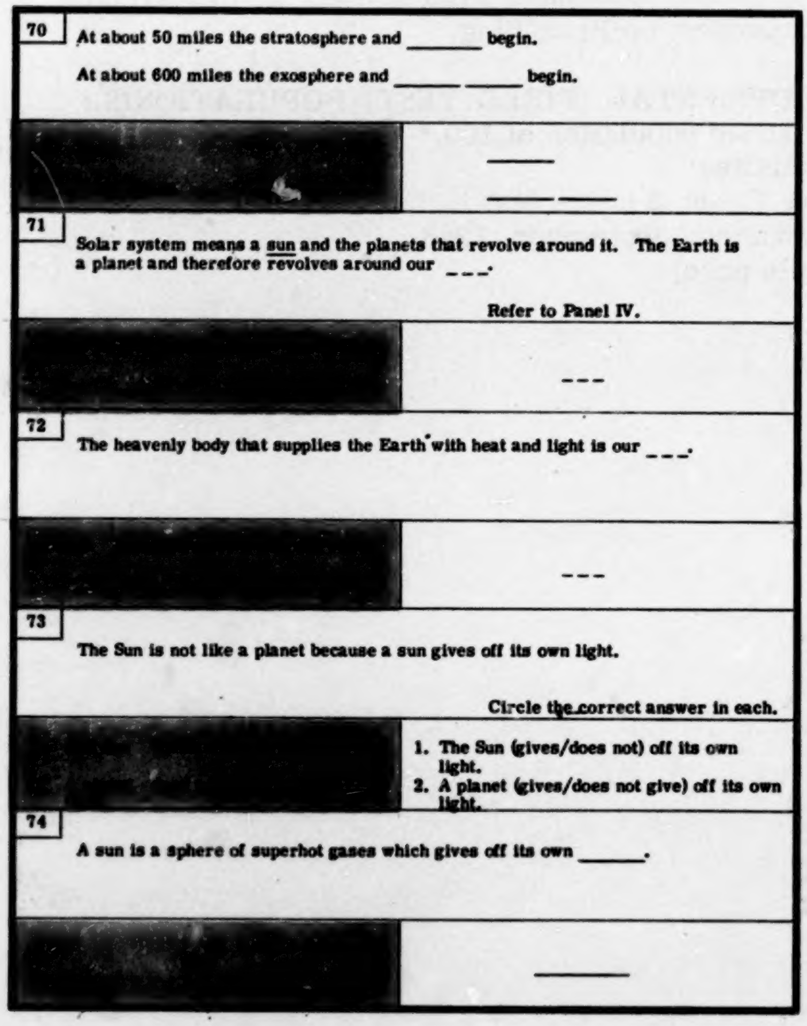
SPACE SCIENCE
RICHARD EDWARDS, Programer, GPTC
JOHN MORRIS, Programer, GPTC
MARY UTTON, Editor, General Programmed Teaching Corporation
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1800 frames, paperback, 300 pp., 8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final tests available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: Junior high students. Field testing: Junior high students."
Prerequisites: None.
Average Time: 15 hours (based entirely on data).
Next Revision: 1968.
(1 sample page)

GENERAL SCIENCE

SPACE SCIENCE
Edwards, Morris, Utton; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



70

At about 50 miles the stratosphere and ______ begin.

At about 600 miles the exosphere and _____ _____ begin.

______

_____ _____

71

Solar system means a sun and the planets that revolve around it. The Earth is a planet and therefore revolves around our ___.

Refer to Panel IV.

___

72

The heavenly body that supplies the Earth with heat and light is our ___.

___

73

The Sun is not like a planet because a sun gives off its own light.

Circle the correct answer in each.

1. The Sun (gives/does not) off its own light.
2. A planet (gives/does not give) off its own light.

74

A sun is a sphere of superhot gases which gives off its own ______.

______

TELLING TIME FROM THE ROCKS

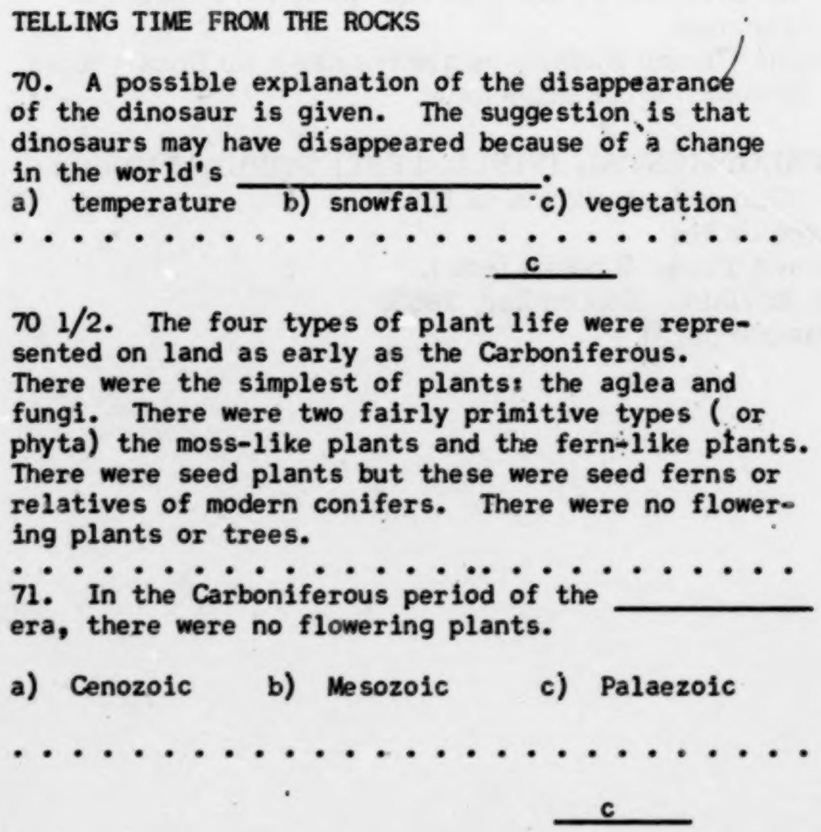
LAURENCE WHISLER, Consultant in Programed Education, Central Scientific Co.
Published by CENTRAL SCIENTIFIC Company, 1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95; 100 frames, program included in price of machine.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Planned population of 100."
Prerequisites:
Average Time: 3 hours (est.).
Next Revision: September, 1963.
(1 sample page)

GENERAL SCIENCE

TELLING TIME FROM THE ROCKS
Whisler; CENTRAL SCIENTIFIC Co.
one sample page:



TELLING TIME FROM THE ROCKS

70. A possible explanation of the disappearance of the dinosaur is given. The suggestion is that dinosaurs may have disappeared because of a change in the world's ________________.

a) temperature b) snowfall c) vegetation

. . . .

c

70 1/2. The four types of plant life were represented on land as early as the Carboniferous. There were the simplest of plants: the aglea and fungi. There were two fairly primitive types (or phyta) the moss-like plants and the fern-like plants. There were seed plants but these were seed ferns or relatives of modern conifers. There were no flowering plants or trees.

. . . .

71. In the Carboniferous period of the ____________ era, there were no flowering plants.

a) Cenozoic b) Mesozoic c) Palaezoic

. . . .

c

GENERAL SCIENCE Jr. H.S.

WATER AS A NATURAL RESOURCE
LAURENCE WHISLER, Consultant in Programed Education, Central Scientific Co.
Published by CENTRAL SCIENTIFIC Company, 1700 Irving Park Road, Chicago 13, Ill.

Planned for use in CENCO PROGRAMED LEARNER, $2.95; 100 problem items, program included in price of machine.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Planned population of 100."
Prerequisites:
Average Time: 3 hours (est.).
Next Revision: September, 1963.
(1 sample page)

GENERAL SCIENCE

WATER AS A NATURAL RESOURCE
Whisler; CENTRAL SCIENTIFIC CO.
one sample page:

WATER AS A NATURAL RESOURCE

12. California has two areas of heavy population conentration: around San Francisco Bay and in Southern California around Los Angeles and ________.
a. Sacramento b. San Juan c. San Diego

. . . .

c

13. In the California areas of dense population, the precipitation is ________________________.
a. uniform throughout the year b. heaviest in eary spring c. heaviest in late summer

. . . .

b

SECTION II THE MAP OF USABLE WATER

IN BRIEF: Water users must be compared with usable water. The maps pointed out heavy concentrations of water users. Of course, water is important to all farmers both those near cities and those living in entirely rural areas.

. . . .

14. The usable water in an area depends mostly on the precipitation. But the amount of usable water is also greatly affected by the ________________.
a. length of the days b. direction of wind c. average temperature

. . . .

c

GENERAL SCIENCE Elem.-Jr. H.S.

THE WONDERFUL WORLD OF INSECTS
WILLIAM L. EARLEY, Consultant Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.)
including 3 programs; program reusable, $2.00-$2.50.
Constructed Responses usually used; some Multiple Choice;
some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

GENERAL SCIENCE

THE WONDERFUL WORLD OF INSECTS
Earley; HONOR PRODUCTS COMPANY
one sample page:

Want to see how sharp you are? Try the following multiple choice and true-false problems. The roll won't advance unless you press the correct button. Score yourself 1 point each time you are right on the first try.	No answer needed
ALL true insects have the following characteristics: a. 8 legs and 2 body parts b. 12 legs and 3 body parts c. 6 legs and 3 body parts d. 6 legs and 2 body parts Press and hold the button of your choice. The roll will move only when you choose the correct answer.	c. 6 legs and 3 body parts
Insects have an internal skeleton. a. True b. False	b. False (They have an outer, or exo-skeleton.)
Metamorphosis is the process of laying eggs through the ovipositer. c. True d. False	d. False (It is a process of change.)
Members of the Diptera order have: a. lacy wings. b. two wings. c. sheathed wings. d. scaly wings.	b. Diptera means "two-wings."

SCIENCE-BIOLOGY H.S.

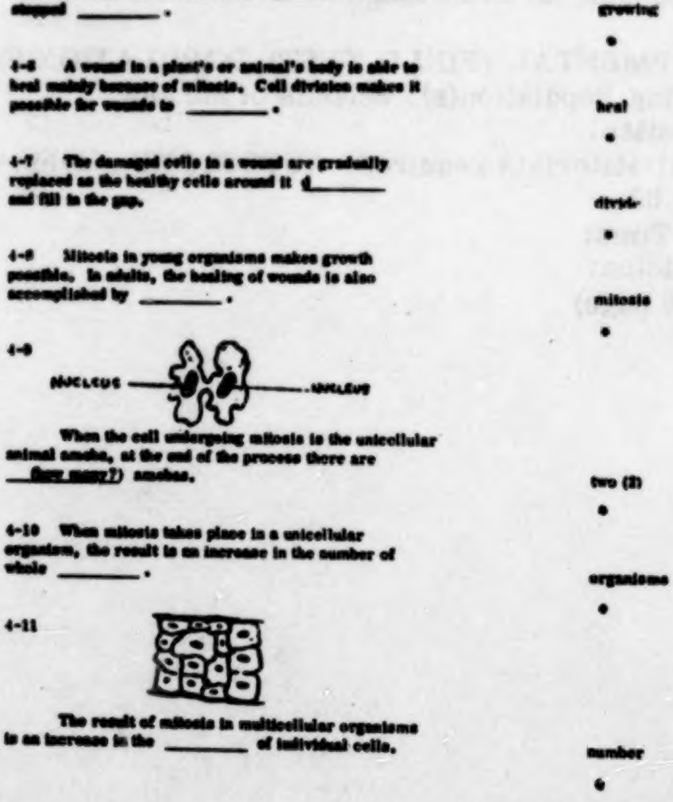
CELLS
Their Structure and Function
MARTA ZABORSKA, Programer, Learning Incorporated.
Published by CORONET INSTRUCTIONAL FILMS,
65 E. So. Water Street, Chicago 1, Illinois

Programed text, 320 frames, paperback, 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"...Small representative samplings at appropriate grade levels tested informally on one-to-one basis with programer. Small representative samplings under controlled conditions (Dukane Redi-tutor using 35 mm. film) for each revision of program. Program has been through 2 complete revisions based on data obtained from formal machine testing as of February 8, 1963. Field testing plan: Classroom testing from 9th through 12th grades administered by classroom teachers. Test areas distributed geographically from Florida to California. All testing conducted by Learning Incorporated."
Prerequisites:
Average Time: "Data incomplete as of Feb. 8, 1963."
Next Revision: "Final revision scheduled for publication in Spring, 1963."
(1 sample page)

SCIENCE-BIOLOGY

CELLS
Zaborska; CORONET INSTRUCTIONAL FILMS
one sample page:



4-5 Mitosis is important in young growing organisms, but it also has a function in adult organisms which have stopped ________ .	growing ●
4-6 A wound in a plant's or animal's body is able to heal mainly because of mitosis. Cell division makes it possible for wounds to ________ .	heal ●
4-7 The damaged cells in a wound are gradually replaced as the healthy cells around it d________ and fill in the gap.	divide ●
4-8 Mitosis in young organisms makes growth possible. In adults, the healing of wounds is also accomplished by ________ .	mitosis ●
4-9 NUCLEUS — NUCLEUS When the cell undergoing mitosis is the unicellular animal ameba, at the end of the process there are ____(how many?) amebas.	two (2) ●
4-10 When mitosis takes place in a unicellular organism, the result is an increase in the number of whole ________ .	organisms ●
4-11 The result of mitosis in multicellular organisms is an increase in the ________ of individual cells.	number ●

SCIENCE-BIOLOGY Jr. H.S.

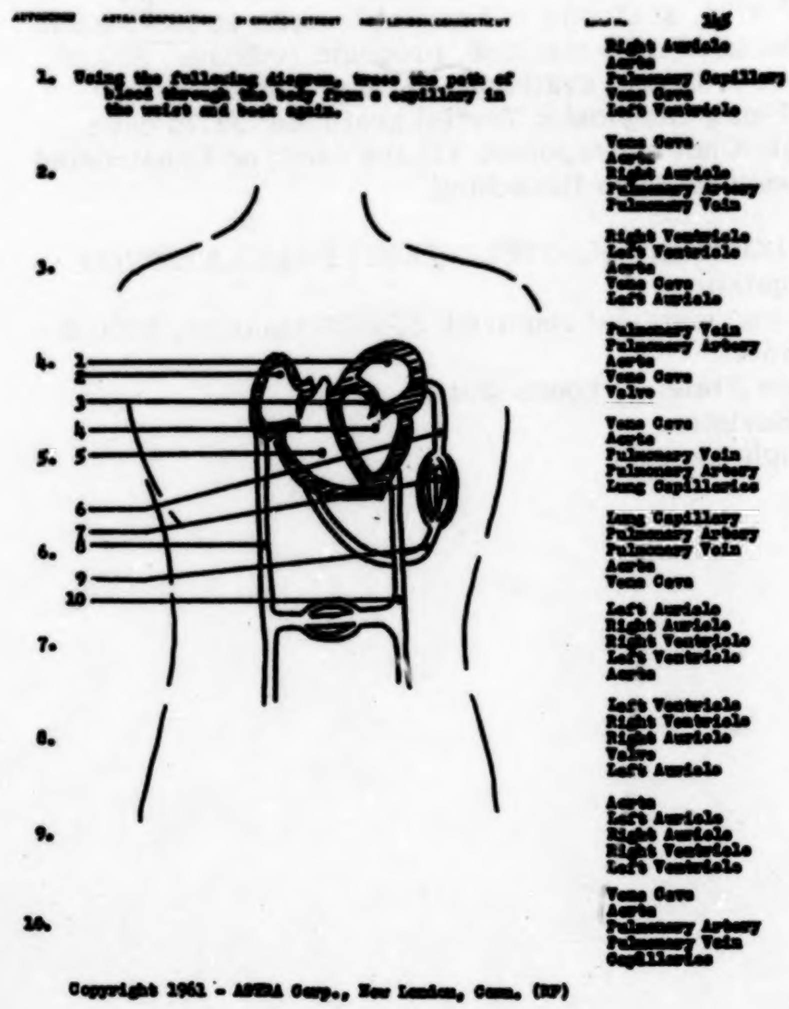
HUMAN ANATOMY & PHYSIOLOGY
ASTRA STAFF
Published by ASTRA
19 Burton Avenue, Norwich, Connecticut

For use in AUTOSCORE machine; program reusable, 850 frames, $20.00.
Multiple Choice Responses always used; no Constructed Responses; no Branching

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Other Using Population(s): Schools of nursing.
Prerequisites:
Additional Materials required: AUTOSCORE machine, $150.00.
Average Time:
Next Revision:
(1 sample page)

SCIENCE-BIOLOGY

HUMAN ANATOMY & PHYSIOLOGY
Astra Staff; ASTRA
one sample page:


1
2
3
4
5
6
7
8
9
10

1. Using the following diagram, trace the path of blood through the body from a capillary in the wrist and back again.
   - Right Auricle
   - Aorta
   - Pulmonary Capillary
   - Vena Cava
   - Left Ventricle

2.
   - Vena Cava
   - Aorta
   - Right Auricle
   - Pulmonary Artery
   - Pulmonary Vein

3.
   - Right Ventricle
   - Left Ventricle
   - Aorta
   - Vena Cava
   - Left Auricle

4.
   - Pulmonary Vein
   - Pulmonary Artery
   - Aorta
   - Vena Cava
   - Valve

5.
   - Vena Cava
   - Aorta
   - Pulmonary Vein
   - Pulmonary Artery
   - Lung Capillaries

6.
   - Lung Capillary
   - Pulmonary Artery
   - Pulmonary Vein
   - Aorta
   - Vena Cava

7.
   - Left Auricle
   - Right Auricle
   - Right Ventricle
   - Left Ventricle
   - Aorta

8.
   - Left Ventricle
   - Right Ventricle
   - Right Auricle
   - Valve
   - Left Auricle

9.
   - Aorta
   - Left Auricle
   - Right Auricle
   - Right Ventricle
   - Left Ventricle

10.
   - Vena Cava
   - Aorta
   - Pulmonary Artery
   - Pulmonary Vein
   - Capillaries

Copyright 1961 - ASTRA Corp., New London, Conn. (NP)

SCIENCE-BIOLOGY

MUSCLES, NERVES AND BONES OF THE HEAD
Published by EDUCATION ENGINEERING, Inc.,
381 West 7th Street, San Pedro, California.

Programed text, 5400 frames, paperback, 180 pp., 5" x 7", available in 5 separate units at $3.75 each.
For use in SPEED machine, program reusable, $50.00.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED machine, $700 & $850.
Average Time: 11 hours (est.).
Next Revision:
(3 sample pages)

SCIENCE-BIOLOGY

MUSCLES, NERVES AND BONES OF THE HEAD
EDUCATION ENGINEERING
3 sample pages:

DIRECTION OF PRESSURE IN MASSAGING MUSCLES

As a general rule, when massaging muscles, manipulate from insertion o origin (upward). A few exceptions xist for muscles that have more ixed attachments with sufficient lexibility to permit massaging over, rosswise or towards origins with-ut irritation.

Light massaging, such as spreading otions, creams, and powders, can e done without respect to direction.

The reasons for massaging from insertion to origin (upward) are:

1. To massage in harmony with muscles and the flow of blood.
2. To prevent irritation.
3. To facilitate contraction (a muscle responds more readily when exercised from its more movable attachment (insertion) to its less movable attachment (origin).

ABC01 - S11

The ___ is the ___ movable attachment and the ___ is the ___ movable attachment.
(1) origin, less, insertion, more
(2) insertion, less, origin, more
(3) none of these

The ___ of nearly all face muscles extend ___ from their ___.
(7) origins, downward, insertions
(8) insertions, downward, origins
(9) insertions, upward, origins
(10) none of these

As a general rule, when massaging muscles, manipulate from ___ to ___ which is in the ___ direction.
(4) insertion, origin, upward
(5) origin, insertion, downward
(6) insertion, origin, downward
(7) origin, insertion, upward

4. A few exceptions exist for muscles that have more ___ attachment with sufficient ___ to permit massaging in other directions without irritation.
(7) fixed, flexibility
(8) fixed, rigidity
(9) flexible, flexibility
(10) none of these

5. One of the reasons for establishing a definite direction of massaging is:
(7) To massage in opposition to the flow of blood.
(8) To prevent contraction.
(9) To cause irritation.
(10) To massage in harmony with muscles and the flow of blood.

ABC01 - Q11

COMPOSITION OF MUSCLES AND THEIR NOURISHMENT

Muscles are composed of reddish fibres which form the red flesh of the body and they are similar to lean meat. They are well supplied with blood vessels, lymphatics, and nerves. In other words muscles are composed of bundles of muscle fibres wrapped together.

Muscles are nourished by food elements delivered to muscle cells by small blood and lymph vessels located in the connective tissue of the muscle.

Each muscle contains blood vessels and lymphatics from which it receives nourishment.

Insertions of nearly all face muscles extend downward from their origin.

ARC01 - 815

1. Where should light pressure be applied in massaging?
   (7) d, i, k, m (9) h, i, k, m
   (8) d, h, i, m (10) none of these

2. Where should firm pressure be applied in massaging?
   (1) b, f, h, i (3) b, f, h, j
   (2) b, f, i, j (4) none of these

3. Most muscles of the face should be massaged from ___ to ___ or ___
   (4) n, a, e (6) n, a, l
   (5) a, n, e (7) a, n, l

4. A few muscles that have more ___ attachments with sufficient ___ do not have to be massaged in the direction described in question 3.
   (5) o, p (7) o, r
   (6) q, r (8) none of these

5. The ___ is the ___ movable and the ___ the ___ movable attachment.
   (7) g, c, h, g (9) n, c, a, g
   (8) b, c, j, g (10) none of these

---

a. origin
b. scalp
c. less
d. around Adam's apple
e. upward
f. sides of back of neck

g. more
h. cheek
i. around chin
j. nose
k. along mandible
l. downward
m. around eye

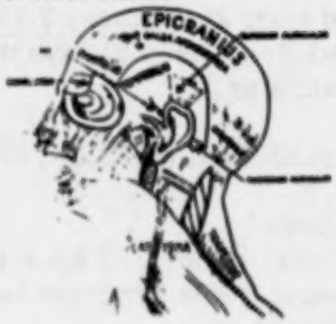
n. insertion
o. fixed
p. flexibility
q. rigid
r. rigidity
s. flexible

ORIGINS AND INSERTIONS OF THREE MUSCLES

ZYGOMATICUS - takes its origin from the zygomatic bone and has its insertion at angle of mouth.

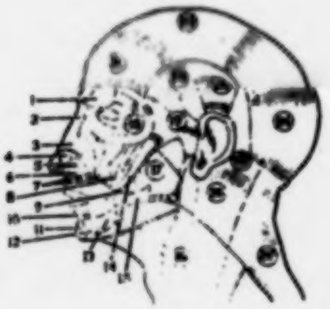
MASSETER - takes its origin from the zygomatic bone and has its insertion in the mandible.

TEMPORALIS - takes its origin from the temporal bone and has its insertion in the mandible.



ABC01 - S15

1. Identify the zygomaticus muscle.
   (5) 17 (6) 21
   (7) 20 (8) 7
2. Identify the masseter muscle.
   (1) 20 (2) 14
   (3) 19 (4) 17
3. Identify the temporalis muscle.
   (1) 18 (2) 20
   (3) 23 (4) 17
4. Name two muscles that take their origin from the zygomatic bone.
   (7) zygomaticus, temporalis
   (8) none of these
   (9) masseter, temporalis
   (10) masseter, zygomaticus
5. Name two muscles that have their insertions in the mandible.
   (7) masseter, temporalis
   (8) zygomaticus, masseter
   (9) zygomaticus, temporalis
   (10) none of these



ABC01 - Q15

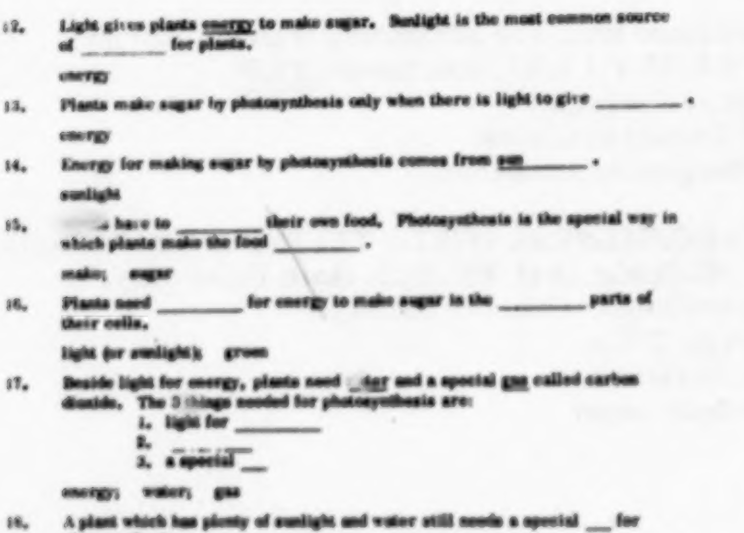
PHOTOSYNTHESIS
MARTA ZABORSKA, Programer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 25 frames, $.15.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): Grade 6.
Prerequisites:
Average Time: Under 1/2 hour (est.).
Next Revision: "The program is the final revision."
(1 sample page)

SCIENCE-BIOLOGY

PHOTOSYNTHESIS
Zaborska; LEARNING INCORPORATED
one sample page:



12. Light gives plants energy to make sugar. Sunlight is the most common source of ________ for plants.

energy

13. Plants make sugar by photosynthesis only when there is light to give ________ .

energy

14. Energy for making sugar by photosynthesis comes from sun______ .

sunlight

15. [illegible]s have to ________ their own food. Photosynthesis is the special way in which plants make the food ________ .

make; sugar

16. Plants need ________ for energy to make sugar in the ________ parts of their cells.

light (or sunlight); green

17. Beside light for energy, plants need _ter and a special gas called carbon dioxide. The 3 things needed for photosynthesis are:
    1. light for ________
    2. ________
    3. a special __

energy; water; gas

18. A plant which has plenty of sunlight and water still needs a special __ for photosynthesis.

gas

19. A plant which has plenty of sunlight for energy and carbon dioxide gas, still needs ________ for photosynthesis.

water

20. Besides light for energy, plants need ________ and a special __ for photosynthesis.

water; gas

21. Water and carbon dioxide gas are used by plants to make the food ________ .

sugar

22. Plants make sugar from water and carbon dioxide gas in the ________ part of their cells.

green

23. To make sugar from water and gas, a plant must have sun to give

sunlight, energy

PROGRAMED GENETICS, Vol. I (of three)
The Basic Concepts
CHESTER A. LAWSON,
MARY ALICE BURMESTER, both of Dept. of Natural Science, Michigan State University
Published by: D. C. HEATH and Co.,
285 Columbus Ave., Boston, Mass.

Programed text, 150 scrambled frames, 320 pp., 6 1/8" x 9 1/4", soft cover, $3.50
Table of Contents
Unit Test(s) available.
All Responses Branched.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"361 Students at Michigan State University."
Prerequisites: General Biology.
Average Time:
Next Revision:
(1 sample page)

SCIENCE-BIOLOGY

PROGRAMED GENETICS
Lawson, Burmester; D. C. HEATH and Co.
one sample page:

THE RELATION OF CONTROLLED BREEDING DATA TO THE GENE THEORY

PART 1

Contributions of Plant and Animal Breeders to the Study of Inheritance

Science consists of two basic components (1) the data collected by observation and (2) the theories that explain the data. The family pedigree of tasters and nontasters discussed in chapters 1 and 2 represented one kind of data concerning inheritance, and the five assumptions about genes developed thus far represented a theory that explained the inheritance of taste reaction to PTC in this family.

THERE ARE OTHER KINDS OF DATA PERTAINING TO HEREDITY WHICH CAN BE COLLECTED AND WHICH MUST ALSO BE EXPLAINED BY THE THEORY IF THE THEORY IS TO BE ACCEPTED. IF THE THEORY DOES NOT EXPLAIN ALL DATA RELATED TO HEREDITY, THEN THE ASSUMPTIONS OF THE THEORY MUST EITHER BE MODIFIED OR ADDITIONAL ASSUMPTIONS MUST BE INVENTED TO ACCOUNT FOR THE FACTS.

The new data consists of collections of observations of pure lines and of hybrids and of the offspring of hybrids.

A pure line is a family or reproductive line in which a certain characteristic remains constant generation after generation. For example, if a family of several generations consisted only of nontasters this family would represent a pure line for this characteristic. Animal and plant breeders frequently attempt to produce pure lines with particularly favorable characteristics. Such pure lines are of value in investigations in heredity.

A breeder selected three pairs of guinea pigs in which coat color is inherited. One pair was white, the other two pairs were black. He bred the white ones. The offspring produced were all white. He continued breeding the white guinea pigs for five generations making brother and sister matings. In each generation only white guinea pigs were produced.

☐ 1. Yes............................page 2b.
☐ 2. No............................page 2a.

The new data consists of collections of observations of pure lines and of hybrids and of the offspring of hybrids.

SCIENCE-BIOLOGY Jr. H.S.+

SECONDARY SCIENCE SERIES - FUNDAMENTALS OF HUMAN PHYSIOLOGY
POLO C. DE BACA
JOHN P. FULLILOVE,both of Teaching Materials Corporation.
Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

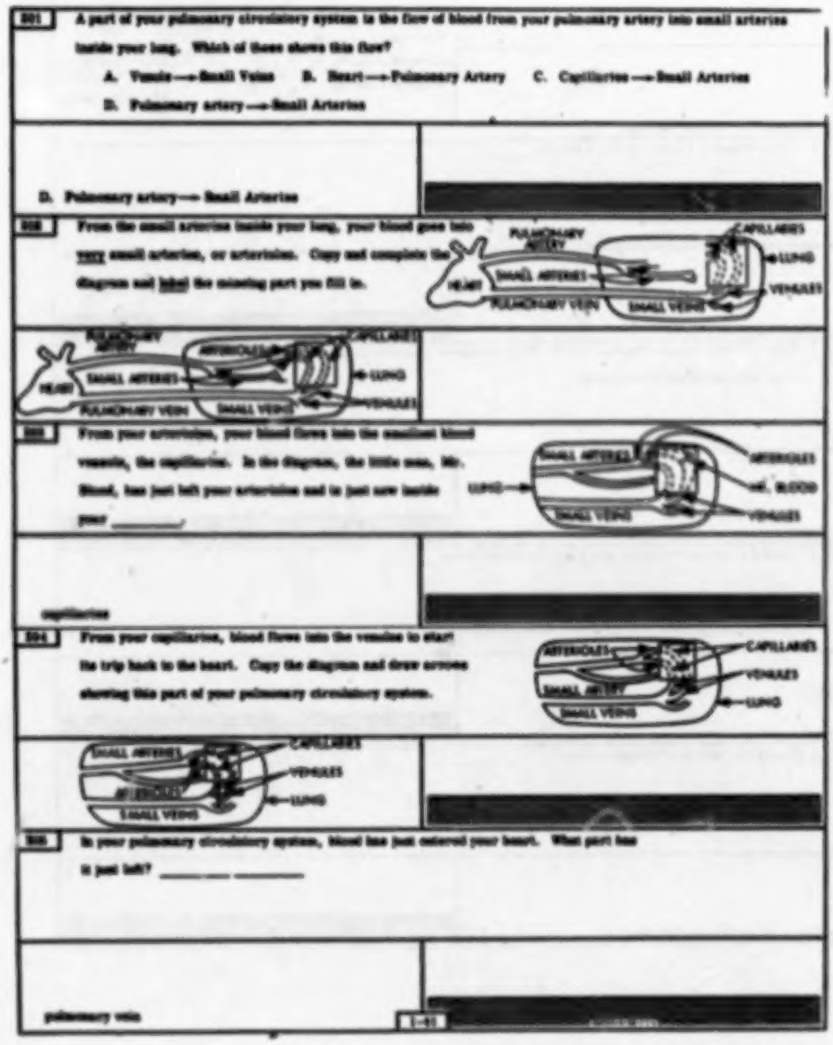
Programed text, 1,968 frames, paperback, 371 pp., 8 1/2" x 11", bound in 2 separate volumes, $11.00.
For use in MIN/MAX II machine, $25.00; program reusable, $10.00.
Teacher's Manual: General Manual available for all TMI-Grolier programs.
Table of Contents.
Unit and Final Test(s) included.
Constructed Responses usually used; no Multiple Choice Responses; no branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "9th graders, average age 14 years."
Prerequisites:
Average Time: 20-30 hours (based entirely on data); standard deviation, 4 hours.
Next Revision: December, 1964.
(2 sample pages)

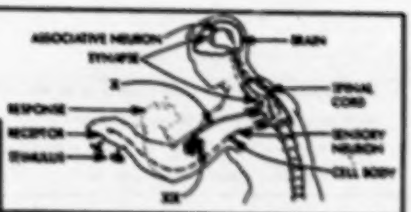
SCIENCE-BIOLOGY

SECONDARY SCIENCE SERIES – FUNDAMENTALS OF HUMAN PHYSIOLOGY

Baca, Fullilove; TEACHING MATERIALS CORPORATION
2 sample pages:



136 Name the X and the XX parts of the diagram.


ASSOCIATIVE NEURON
SYNAPSE
X
RESPONSE
RECEPTOR
STIMULUS
XX
BRAIN
SPINAL CORD
SENSORY NEURON
CELL BODY

XX Effectors X Motor Neurons

137 Meat and ____ are foods which are high in ______

protein

[redacted]

138 When a sensory impulse leaves a sensory neuron and goes to an associative neuron, there is a ______ between the sensory and associative neurons.

synapse

[redacted]

139 Voluntary muscles are made up of many tiny fibers called ______.

fibrils

[redacted]

140 What is the function of hyaline cartilage? ------------

to protect or cushion movable joints

6-10

[redacted]

SCIENCE-BIOLOGY Jr. H.S.

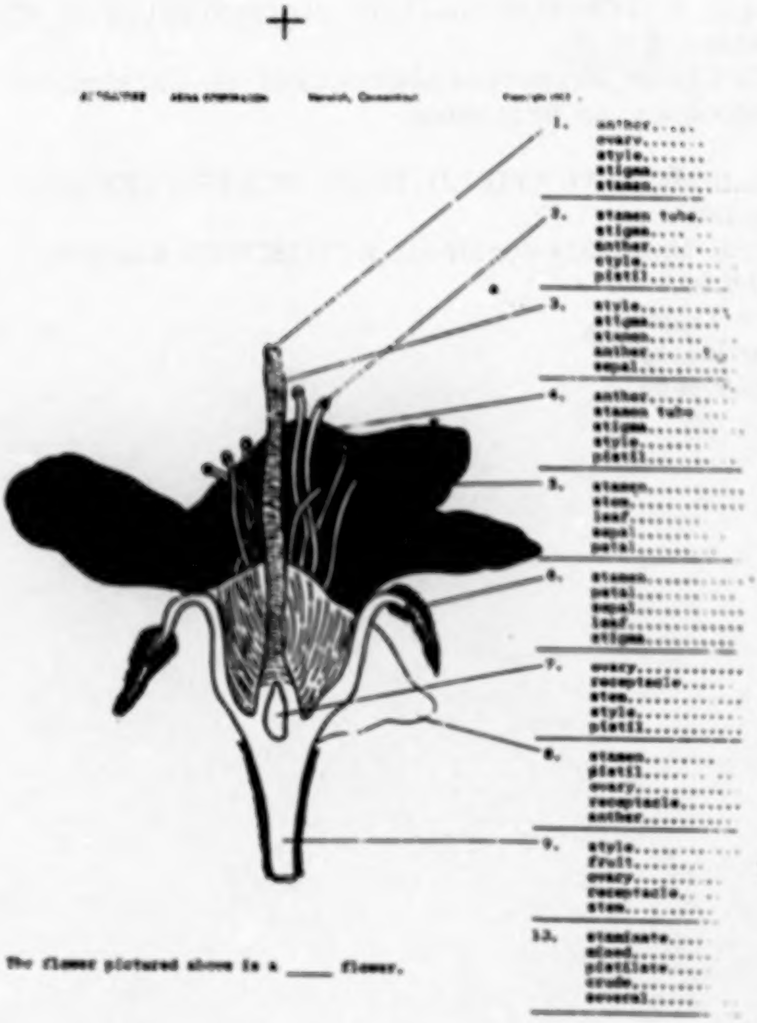
SPERMATOPHYTES
ASTRA STAFF
Published by ASTRA
19 Burton Avenue, Norwich, Connecticut

For use in AUTOSCORE machine; program reusable, 690 frames, $20.00.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional Materials required: AUTOSCORE machine, $150.00.
Average Time:
Next Revision:
(1 sample page)

SCIENCE-BIOLOGY

SPERMATOPHYTES
Astra Staff; ASTRA
one sample page:



[illegible] [illegible] Norwich, Connecticut [illegible]

1. anther.
   ovary.
   style.
   stigma.
   stamen.
2. stamen tube.
   stigma.
   anther.
   style.
   pistil.
3. style.
   stigma.
   stamen.
   anther.
   sepal.
4. anther.
   stamen tube
   stigma.
   style.
   pistil.
5. stamen.
   stem.
   leaf.
   sepal.
   petal.
6. stamen.
   petal.
   sepal.
   leaf.
   stigma.
7. ovary.
   receptacle.
   stem.
   style.
   pistil.
8. stamen.
   pistil.
   ovary.
   receptacle.
   anther.
9. style.
   fruit.
   ovary.
   receptacle.
   stem.

13. staminate.
    mixed.
    pistillate.
    crude.
    several.

The flower pictured above is a ____ flower.

ATOMS, ELECTRONS AND THE STRUCTURE OF MATTER
Unit I of "COMPLETE ATOMIC THEORY & ITS APPLICATIONS"
H. YILMAZ, Research-Biology: MIT; Dept. of Nuclear Physics, Northeastern University; and research scientist: Arthur D. Little Corp.
Published by LEARNING FOUNDATIONS INSTITUTE Inc., 271 North Avenue, New Rochelle, N.Y.

For use in LEARNATRON MARK II, A/Z MARK I & II machines, $89-$495; program reusable, Unit I: 170 frames; complete course: 730 frames, $25.00 per unit.
Programed text planned.
Table of Contents.
Unit and Final Test(s) included.
Program available in French, Turkish, Urdu.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "International Camp and Children's Colony (Lakeville, Conn.): advanced students and teachers' training camp."
Prerequisites:
Average Time: 5-7 hours, complete program (est.).; 1/2 hour, Unit I (est.).
Next Revision: 1964.
(1 sample page)

SCIENCE-CHEMISTRY

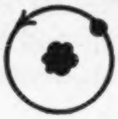
ATOMS, ELECTRONS AND THE STRUCTURE OF MATTER
Yilmaz; LEARNING FOUNDATIONS INSTITUTE
one sample page:

LEARNING
FOUNDATIONS
INSTITUTE, INC.

CLOSE THE FRAME TO SMALL WINDOW

11. This diagram of an atom is also incomplete. Draw a complete atom the way you think it should be.

COULD BE ONE OR MORE



12. Electrons are not exactly like planets. Planets are of different size and weight. Electrons have all the same w-----.

WEIGHT

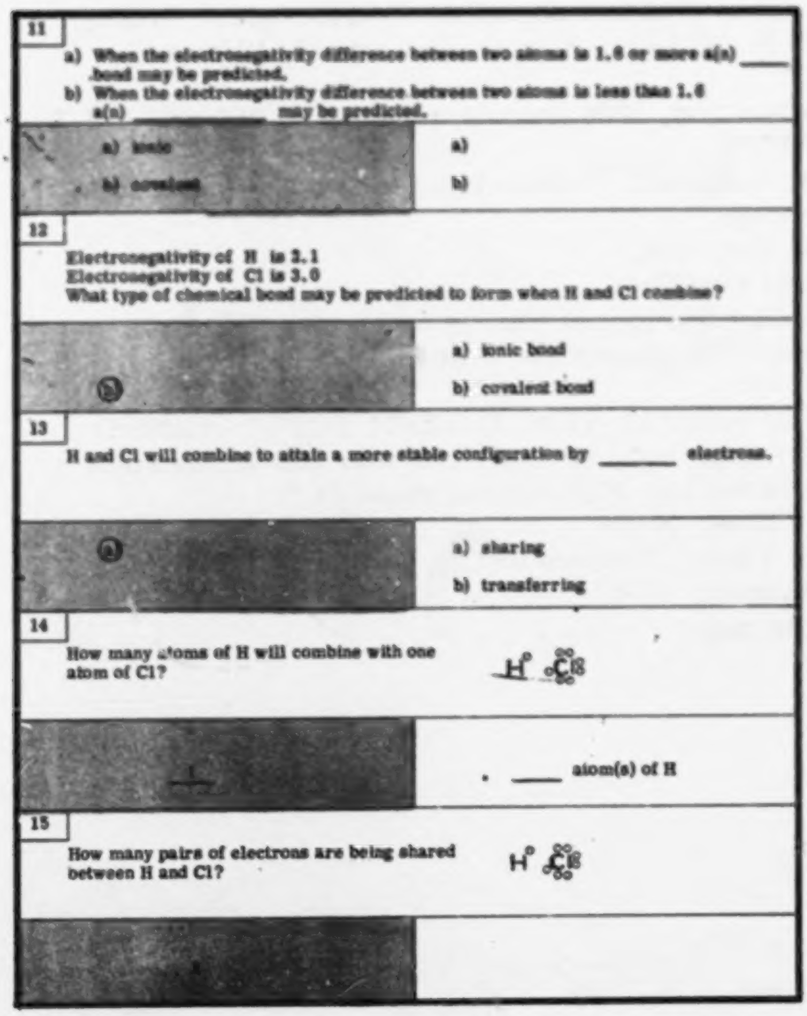
CHEMICAL BONDING
LINDA LUE DORAN, Programer, General Programmed Teaching Corporation
SHIRLEY B. BITTERLICH, Editor, General Programmed Teaching Corporation
TAYLOR ABEGG, Subject Matter Expert
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1800 frames, paperback, 360 pp., 8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: 11th and 12th grade students. Field testing: High school students."
Prerequisites: None.
Average Time: 17 hours (est.).
Next Revision: 1968.
(1 sample page)

SCIENCE-CHEMISTRY

CHEMICAL BONDING
Doran, Bitterlich, Abegg; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



11

a) When the electronegativity difference between two atoms is 1.6 or more a(n) _____ bond may be predicted.
b) When the electronegativity difference between two atoms is less than 1.6 a(n) ______________ may be predicted.

a) ionic b) covalent	a) b)

12

Electronegativity of H is 2.1
Electronegativity of Cl is 3.0
What type of chemical bond may be predicted to form when H and Cl combine?

ⓑ	a) ionic bond b) covalent bond

13

H and Cl will combine to attain a more stable configuration by _______ electrons.

ⓐ	a) sharing b) transferring

14

How many atoms of H will combine with one atom of Cl? H Cl

1	_____ atom(s) of H

15

How many pairs of electrons are being shared between H and Cl? H Cl

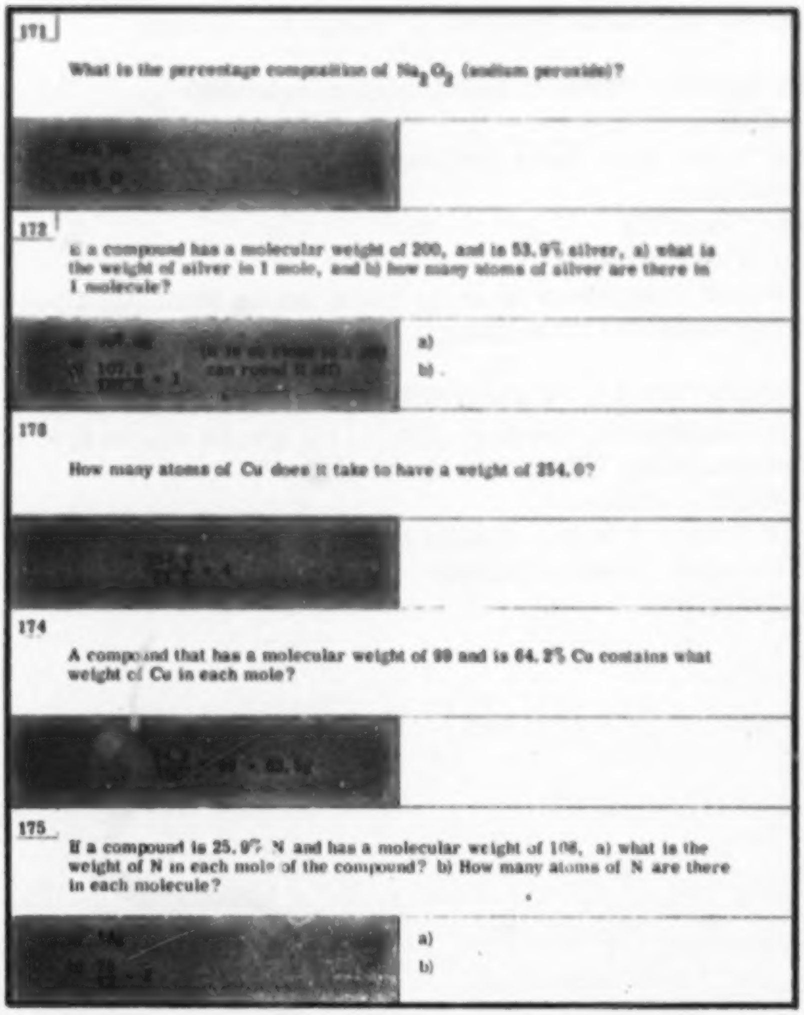
CHEMICAL MATHEMATICS
SHIRLEY B. BITTERLICH, Programer, General Programmed Teaching Corporation
WAYNE T. ALCOCK, Editor, General Programmed Teaching Corporation
TAYLOR ABEGG, Subject Matter Expert
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1000 frames, paperback, 200 pp., 8-1/2" x 11", $______.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: 10th-11th grade students. Field testing: High school students."
Prerequisites: None.
Average Time: 9 hours (based entirely on data).
Next Revision: Undetermined.
(1 sample page)

SCIENCE-CHEMISTRY

CHEMICAL MATHEMATICS
Bitterlich, Alcock, Abegg; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



171

What is the percentage composition of Na_2O_2 (sodium peroxide)?

[illegible]

172

If a compound has a molecular weight of 200, and is 53.9% silver, a) what is the weight of silver in 1 mole, and b) how many atoms of silver are there in 1 molecule?

[illegible]

a)
b)

173

How many atoms of Cu does it take to have a weight of 254.0?

[illegible]

174

A compound that has a molecular weight of 99 and is 64.2% Cu contains what weight of Cu in each mole?

[illegible]

175

If a compound is 25.9% N and has a molecular weight of 108, a) what is the weight of N in each mole of the compound? b) How many atoms of N are there in each molecule?

[illegible]

a)
b)

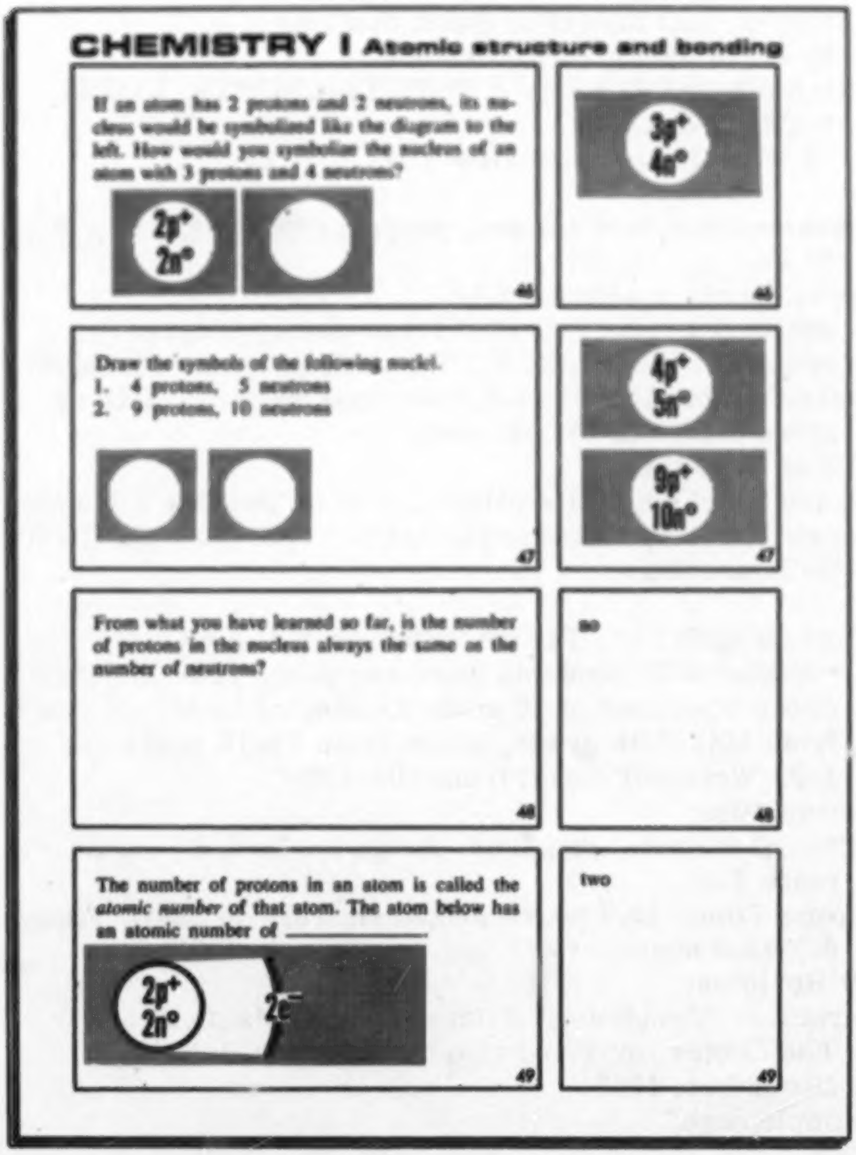
CHEMISTRY I
Atomic Structure and Bonding
CHARLES R. DAWSON, Dept. of Chemistry, Columbia University
STEPHEN A. RUDOLPH, Basic Systems
STEPHEN DRUGER, Basic Systems
ROBERT J. LEFKOWITZ, Basic Systems
DAVID J. DAWSON, Basic Systems
Published by APPLETON-CENTURY-CROFTS, LYONS & CARNAHAN,
34 West 33rd Street, New York 1, N.Y.

Programed text, 804 frames, paperback, 280 pp., 6" x 9", $3.24.
Answer Sheets available, $.64.
For use in KONCEPT-O-GRAPH machine, program reusable; GRAFLEX MICRO-AID, program reusable.
Teacher's Manual available, free upon adoption of 10 or more copies of the program.
Table of Contents.
Unit and Final Test(s) available, free in Teacher's Manual.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"A total of 26 students were sampled. The validation group consisted of 12 students ranging in school grade from 10th-12th grade, in age from 14-17 years and in I.Q. (Wechsler form) from 102-138."
Prerequisites:
Additional material required: Response book 83 pages, price $.64.
Average Time: 10.9 hours (based entirely on data). Range: 6.5-15.3 hours.
Next Revision:
Literature: "Spectrum," Pfizer Medical Magazine; The Center for Programed Instruction Bulletin, December, 1962.
(1 sample page)

SCIENCE-CHEMISTRY

CHEMISTRY I
Dawson, Rudolph, Druger, Lefkowitz, Dawson; APPLETON-CENTURY-CROFTS, LYONS
one sample page:



CHEMISTRY I Atomic structure and bonding

If an atom has 2 protons and 2 neutrons, its nucleus would be symbolized like the diagram to the left. How would you symbolize the nucleus of an atom with 3 protons and 4 neutrons? 46	46
Draw the symbols of the following nuclei. 1. 4 protons, 5 neutrons 2. 9 protons, 10 neutrons 47	47
From what you have learned so far, is the number of protons in the nucleus always the same as the number of neutrons? 48	no 48
The number of protons in an atom is called the *atomic number* of that atom. The atom below has an atomic number of __________ 49	two 49

SCIENCE-CHEMISTRY H.S.

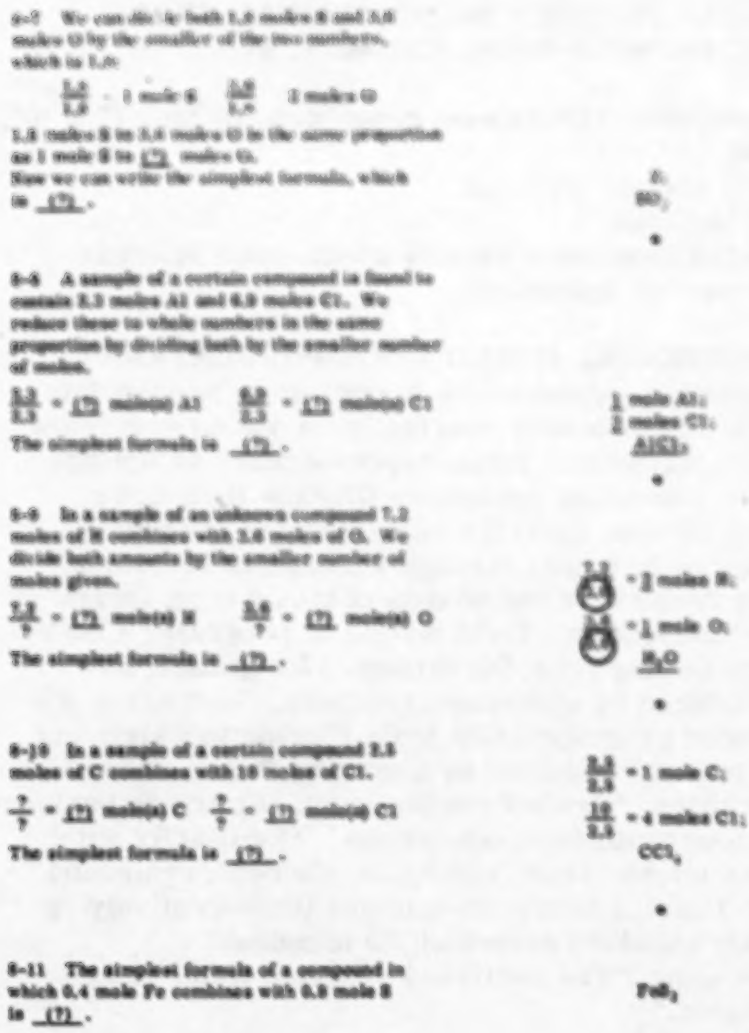
CHEMISTRY CONCEPTS
The Molar Method
THOMAS MAXWELL, Programer, Learning Incorporated
SHEILA M. LEVINSKY, Programer, Learning Incorporated
DUANE BROWN, Dept. of Chemistry, Arizona State University
Published by CORONET INSTRUCTIONAL FILMS
65 E. So. Water Street, Chicago 1, Ill.

Programed text, 310 frames, paperback, 59 pp., 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "...Small representative samplings at appropriate grade levels tested informally on one-to-one basis with programer. Small representative samplings under controlled conditions (Dukane Redi-tutor using 35 mm. film) for each revision of program. Program has been through 9 complete revisions, each revision based on data obtained from formal machine testing. Field testing in progress: Classroom testing from 9th through 12th grades, administered by classroom teachers. Test areas distributed geographically from Florida to California. All testing conducted by Learning Incorporated."
Prerequisities: "Grade 9 reading level. Ability to perform the four arithmetic operations. Familiarity with these terms: atom, molecule, element, compound."
Average Time: 3 hours, 55 minutes (based entirely on data); standard deviation, 30 minutes.
Next Revision: "The published program is the final revision."
(1 sample page)

SCIENCE-CHEMISTRY

CHEMISTRY CONCEPTS
Maxwell, Levinsky, Brown; CORONET INSTRUCTIONAL FILMS
one sample page:



8-7 We can divide both 1.8 moles S and 3.6 moles O by the smaller of the two numbers, which is 1.8:

$\frac{1.8}{1.8}$ = 1 mole S $\frac{3.6}{1.8}$ = 2 moles O

1.8 moles S to 3.6 moles O is the same proportion as 1 mole S to (?) moles O.
Now we can write the simplest formula, which is (?) .

2;
SO_2

●

8-8 A sample of a certain compound is found to contain 2.3 moles Al and 6.9 moles Cl. We reduce these to whole numbers in the same proportion by dividing both by the smaller number of moles.

$\frac{2.3}{2.3}$ = (?) mole(s) Al $\frac{6.9}{2.3}$ = (?) mole(s) Cl

The simplest formula is (?) .

1 mole Al;
3 moles Cl;
$AlCl_3$

●

8-9 In a sample of an unknown compound 7.2 moles of H combines with 3.6 moles of O. We divide both amounts by the smaller number of moles given.

$\frac{7.2}{?}$ = (?) mole(s) H $\frac{3.6}{?}$ = (?) mole(s) O

The simplest formula is (?) .

$\frac{7.2}{3.6}$ = 2 moles H;
$\frac{3.6}{3.6}$ = 1 mole O;
H_2O

●

8-10 In a sample of a certain compound 2.5 moles of C combines with 10 moles of Cl.

$\frac{?}{?}$ = (?) mole(s) C $\frac{?}{?}$ = (?) mole(s) Cl

The simplest formula is (?) .

$\frac{2.5}{2.5}$ = 1 mole C;
$\frac{10}{2.5}$ = 4 moles Cl;
CCl_4

●

8-11 The simplest formula of a compound in which 0.4 mole Fe combines with 0.8 mole S is (?) .

FeS_2

SCIENCE-CHEMISTRY H.S.+

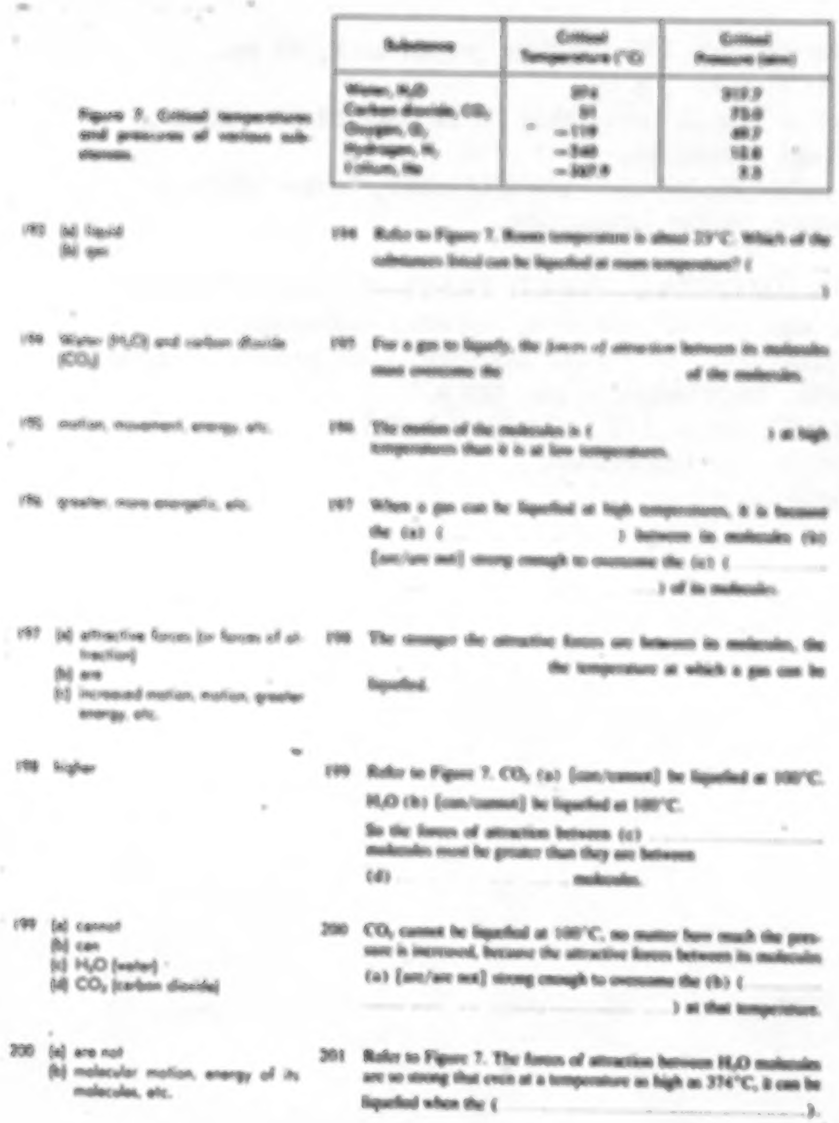
GASES: KINETIC-MOLECULAR THEORY OF GASES
RENÉE FORD, Center for Programed Instruction, Inc.
Published by HOLT, RINEHART & WINSTON,
383 Madison Ave., N. Y. 17.

Programed text, 252 frames, paperback, 46 pp., 8-1/2" x 11", $.48.
Teacher's Manual available, free with class orders.
Final Test available.
Constructed Responses usually used, some Multiple choice, some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "2 high school classes, several individuals."
Prerequisites: "One year algebra, 10th grade reading level, knowledge of gas laws."
Average Time: 2-1/2 - 4 hours (est.).
Next Revision: Uncertain.
(1 sample page)

SCIENCE-CHEMISTRY

GASES: KINETIC-MOLECULAR THEORY OF GASES
Ford; HOLT, RINEHART & WINSTON
one sample page:



Substance	Critical Temperature (°C)	Critical Pressure (atm)
Water, H_2O	374	217.7
Carbon dioxide, CO_2	31	73.0
Oxygen, O_2	−119	49.7
Hydrogen, H_2	−240	12.8
Helium, He	−267.9	2.3

Figure 7. Critical temperatures and pressures of various substances.

193 (a) liquid (b) gas	194 Refer to Figure 7. Room temperature is about 25°C. Which of the substances listed can be liquefied at room temperature? (............)
194 Water (H_2O) and carbon dioxide (CO_2)	195 For a gas to liquefy, the *forces of attraction* between its molecules must overcome the .... of the molecules.
195 motion, movement, energy, etc.	196 The motion of the molecules is (............) at high temperatures than it is at low temperatures.
196 greater, more energetic, etc.	197 When a gas can be liquefied at high temperatures, it is because the (a) (............) between its molecules (b) [are/are not] strong enough to overcome the (c) (............) of its molecules.
197 (a) attractive forces (or forces of attraction) (b) are (c) increased motion, motion, greater energy, etc.	198 The stronger the attractive forces are between its molecules, the .... the temperature at which a gas can be liquefied.
198 higher	199 Refer to Figure 7. CO_2 (a) [can/cannot] be liquefied at 100°C. H_2O (b) [can/cannot] be liquefied at 100°C. So the forces of attraction between (c) .... molecules must be greater than they are between (d) .... molecules.
199 (a) cannot (b) can (c) H_2O (water) (d) CO_2 (carbon dioxide)	200 CO_2 cannot be liquefied at 100°C, no matter how much the pressure is increased, because the attractive forces between its molecules (a) [are/are not] strong enough to overcome the (b) (............) at that temperature.
200 (a) are not (b) molecular motion, energy of its molecules, etc.	201 Refer to Figure 7. The forces of attraction between H_2O molecules are so strong that even at a temperature as high as 374°C, it can be liquefied when the (............).

GASES: GAS LAWS
RENÉE FORD, Center for Programed Instruction.
Published by HOLT, RINEHART AND WINSTON,
383 Madison Avenue, N. Y. 17, N.Y.

Programed text, 398 frames, paperback, 72 pp., 8-1/4" x 11, $.48.
Teacher's Manual available, free with class orders.
Final Test available.
Constructed Responses usually used; some Multiple choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "2 High School classes, several individuals."
Prerequisites: "One year of Algebra, 10th grade reading level."
Average Time: 7-10 hours (est.).
Next Revision: Uncertain.
(1 sample page)

SCIENCE-CHEMISTRY

GASES: GAS LAWS
Ford; HOLT, RINEHART AND WINSTON
one sample page:

Problem 12. A sample of gas occupies a volume of 700 cc at 25°C and atmospheric pressure. Calculate the volume occupied by the same sample of gas at atmospheric pressure and 1515°C.

218 [illegible] 1.2 liters × $\frac{4}{3}$ = 1.6 liters
(b) 0.4 li[illegible]

219 Read Problem 12. Both temperatures are given in
(a) .... (units) and therefore must be converted
to the (b) .... scale before determining the final volume.

219 (a) °C
(b) Kelvin (°K)

220 Refer to Problem 12. Tabulate the data:

	Absolute temperature	Volume
original		
final		?

220

	Absolute temperature	Volume
original	298°K	700 cc
final	1788°K	?

Correct your data table before proceeding.

221 Refer to your data table for Problem 12. Write the equation you would use to find the volume:
.... × .... = *(do not solve)*

221 Select the box containing the equation which is most like your answer for #221.

A
1. 700 cc × $\frac{1}{6}$ =
2. 700 cc × $\frac{298}{1788}$ =
3. either of above without units

B
1. 700 × 6 =
2. 700 × $\frac{1788}{298}$ =

C
1. 700 cc × 6 =
2. 700 cc × $\frac{1788}{298}$ =

If your equation is in Box A—go to 222.
If your equation is in Box B—go to 228.
If your equation is in Box C—go to 229.

SCIENCE-CHEMISTRY H.S.

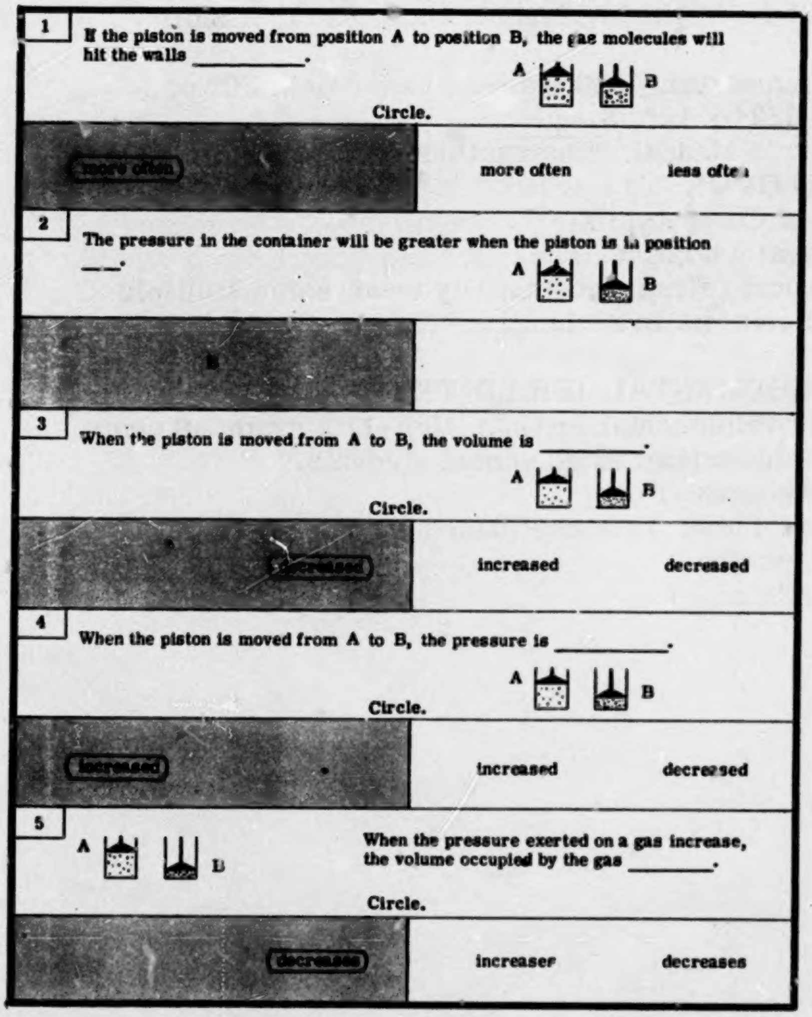
GAS LAWS
JACOB REGER, Programer, General Programmed Teaching Corporation
SHIRLEY B. BITTERLICH, Editor, GPTC
TAYLOR ABEGG, Subject Matter Expert
Published by ENCYCLOPAEDIA BRITANNICA PRESS, 425 N. Michigan Avenue, Chicago 11, Illinois

Programed text, 1800 frames, paperback, 300 pp., 8-1/2" x 11", $____.
Teacher's Manual: "Instructions to teacher included in preface."
Table of Contents.
Final test available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Developmental testing: 10th-11th grade students. Field testing: High school students."
Prerequisites: None.
Average Time: 15 hours (based entirely on data).
Next Revision:
(1 sample page)

SCIENCE-CHEMISTRY

GAS LAWS
Reger, Bitterlich, Abegg; ENCYCLOPAEDIA BRITANNICA PRESS
one sample page:



1 If the piston is moved from position A to position B, the gas molecules will hit the walls __________.

A B

Circle.

[✓ more often]

more often   less often

2 The pressure in the container will be greater when the piston is in position ___.

A B

B

3 When the piston is moved from A to B, the volume is __________.

A B

Circle.

[✓ decreased]

increased   decreased

4 When the piston is moved from A to B, the pressure is __________.

A B

Circle.

[✓ increased]

increased   decreased

5 A B

When the pressure exerted on a gas increase, the volume occupied by the gas ________.

Circle.

[✓ decreases]

increases   decreases

SCIENCE - CHEMISTRY Coll.

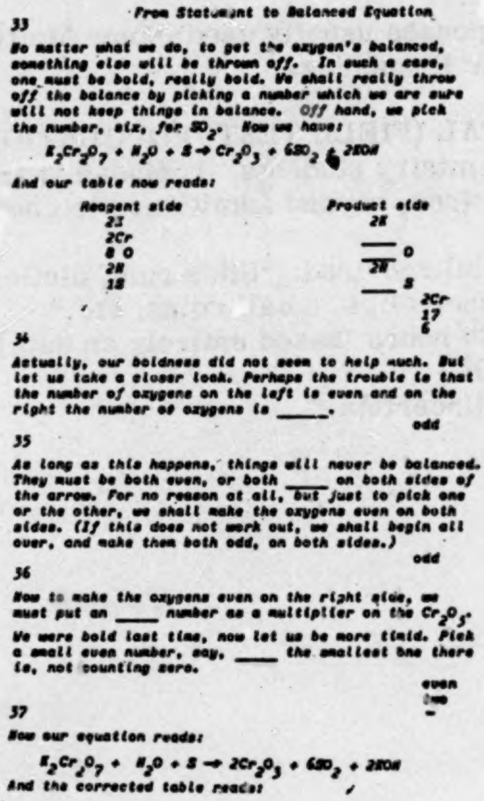
INTRODUCTION TO CHEMICAL CONCEPTS
JAY A. YOUNG, Professor of Chemistry, King's College
Published by: PRENTICE-HALL, Inc.,
Englewood Cliffs, New Jersey

Programed text, 1000 frames, paperback, 100 pp., 5" x 8", $2.95.
Table of Contents.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "College chemistry students, freshman year."
Prerequisites: "None, beyond admittance to chemistry course."
Additional material required: "Slide rule, dictionary, metric ruler, paper clips, small coins, etc."
Average Time: 20 hours (based entirely on data); standard deviation: 60%.
Next Revision: "Uncertain."
(1 sample page)

SCIENCE-CHEMISTRY

INTRODUCTION TO CHEMICAL CONCEPTS
Young; PRENTICE-HALL
one sample page:



From Statement to Balanced Equation

33

No matter what we do, to get the oxygen's balanced, something else will be thrown off. In such a case, one must be bold, really bold. We shall really throw off the balance by picking a number which we are sure will not keep things in balance. Off hand, we pick the number, six, for SO_2. Now we have:

$$K_2Cr_2O_7 + H_2O + S \rightarrow Cr_2O_3 + 6SO_2 + 2KOH$$

And our table now reads:

Reagent side	Product side
2K	2K
2Cr	____ O
8 O	2H
2H	____ S
1S	

2Cr
17
6

34

Actually, our boldness did not seem to help much. But let us take a closer look. Perhaps the trouble is that the number of oxygens on the left is even and on the right the number of oxygens is ______.

odd

35

As long as this happens, things will never be balanced. They must be both even, or both _____ on both sides of the arrow. For no reason at all, but just to pick one or the other, we shall make the oxygens even on both sides. (If this does not work out, we shall begin all over, and make them both odd, on both sides.)

odd

36

Now to make the oxygens even on the right side, we must put an _____ number as a multiplier on the Cr_2O_3. We were bold last time, now let us be more timid. Pick a small even number, say, _____ the smallest one there is, not counting zero.

even
two

37

Now our equation reads:

$$K_2Cr_2O_7 + H_2O + S \rightarrow 2Cr_2O_3 + 6SO_2 + 2KOH$$

And the corrected table reads:

SCIENCE - CHEMISTRY H.S.-Coll.

LIQUIDS AND SOLUTIONS
JAY A. YOUNG, Professor of Chemistry, King's College
Published by JAY A. YOUNG, Kings College, Wilkes-Barre, Pa.

Programed text, 500 frames, paperback, 101 pp., 5" x 8", $1.40.
Table of Contents.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "College chemistry students, freshman year."
Prerequisites: "None, beyond admittance to chemistry course."
Additional materials required: "Slide rule, dictionary, metric ruler, paper clips, small coins, etc."
Average Time: 15 hours (based entirely on data); standard deviation: 60%
Next Revision: "Uncertain."
(1 sample frame

SCIENCE-CHEMISTRY

LIQUIDS AND SOLUTIONS
Young; JAY A. YOUNG
one sample frame:

Concentration; Molar and Formal

2

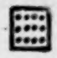


Figure 1

Now let us proceed to the development of the significance of the concept of concentration. In the illustration, figure 1, there is a square 1.0 cm on each side. By counting, we can see that there are ____ dots inside the square. The area of the square is ____ cm^2.

12
1.0

3

That is, in figure 1, the concentration of dots is ___ dots per ____ cm^2.

12
1.0

4

The word, "concentration" is always associated with the word "per". In figure 1, the concentration of dots is 12 dots ____ 1.0 cm^2.

per

5

*The word, per, has several meanings. We are using it here to mean "for each", or "in each". Thus, if you work 10 hours for an employer and are paid $250.00, your wage is $25.00 ____ hour. Now, refer to figure 1; the concentration of dots in figure 1 is *____.*

per
12 dots per 1.0 cm^2

6

*Mathematically, the word, per, indicates a division, or a fraction, which is the same thing. Thus, we might say, from our example, that your wage is $\frac{25.00 \text{ dollars}}{1 \text{ hour}}$. Or, in figure 1, writing the concentration of dots as a fraction, the concentration of dots is *______.*

$\frac{12 \text{ dots}}{1.0 \text{ cm}^2}$

7

*As we know, we need not write a one when it appears in the denominator of a fraction, so, we could say that your wage is 25.00 $\frac{\text{dollars}}{\text{hour}}$. Or, that the concentration of dots in figure 1 is *____.*

12 $\frac{\text{dots}}{\text{cm}^2}$

SCIENCE-CHEMISTRY **Elem.**

MATTER AND ATOMIC STRUCTURE
BERTRAM M. SIEGEL
DAVID BELASH
LEWIS D. EIGEN
SETH WOHL, Programers, The Center for Programed Instruction, Inc.
Published by SCIENCE RESEARCH ASSOCIATES, Inc., 259 East Erie Street, Chicago 11, Illinois.

Programed text, 800 frames, paperback, 180 pp., 8 1/2" x 11", available in 2 separate volumes at $1.00 each.
Answer Sheets available, $.39.
Teacher's Manual available, $.50 (free with class orders).
Table of Contents.
Final Test available, $.10 (free with answer sheets).
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Slightly above average 4th, 5th and 6th grade students."
Prerequisites: "4th grade reading level."
Average Time: 7 1/2 hours (est.).
Next Revision: June, 1965.
(1 sample page)

SCIENCE-CHEMISTRY

MATTER AND ATOMIC STRUCTURE
Siegel, Belash, Eigen, Wohl; SCIENCE RESEARCH ASSOCIATES

one sample page:

4-31 "So", said Mic, "in an atom of any element, the number of protons (is or is not) ☐ the same as the number of electrons. The number of neutrons is (always or sometimes) ☐ the same as the number of protons."

5-13 "So", said Mic, "if I wanted to write that iron has an atomic number of 26, I would write $_{26}Fe$."
Show how you would write that Cu has an atomic number of 29.
☐

5-42 "In the symbols for all the other 101 elements, the mass number is always (larger than or smaller than or equal to) ☐ the atomic number. But in the symbol for hydrogen, the mass number is (larger than or smaller than or equal to) ☐ the atomic number.

6-25 "A molecule that contains two or more atoms is called a compound", said Jumbo. "A compound (can or cannot) ☐ contain only one kind of atom."

6-33 "A molecule of H_2S, which is a bad-smelling gas, contains (How many?) ☐ atom(s) of hydrogen and (How many?) ☐ atom(s) of sulfur," Jumbo continued.

7-27 The picture of a CO_2 molecule in Exhibit 4 is (less or more) complicated than this picture of a CO_2 molecule. Ⓞ-Ⓒ-Ⓞ

PRINCIPLES OF CHEMISTRY
FRANK E. HARRIS, Dept. of Chemistry, Stanford University, in conjunction with Behavioral Research Laboratories, Palo Alto, California.
Published by ADDISON-WESLEY Publishing Co., Inc. Reading, Mass.

Programed text, 18,000-20,000 frames, paperback, 2000 pp., 8-1/2" x 11", $23.50 (approx.).
Teacher's Manual available.
Table of Contents.
Unit, Final, Diagnostic Test(s) available. More than one equivalent form of Unit Test available.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Student tested with both classroom groups and some control groups. I.Q. range of 94-145."
Prerequisites: "Two years high school math training or any ability to learn it easily."
Average Time: "Designed for full year introductory chemistry course."
Next Revision:
(1 sample page)

SCIENCE-CHEMISTRY

PRINCIPLES OF CHEMISTRY
Harris; ADDISON-WESLEY
one sample page:

SECTION 1 CHEMISTRY

1.	The world contains many substances. Water is a __________.	substance
2.	Silver and gold are also __________.	substances
3.	Some substances are solids. Silver is a solid __________; gold is a __________ __________.	substance solid substance
4.	Some substances are liquid. Water is a __________.	liquid
5.	Some substances are gases. Air is a gaseous substance. Steam is another __________ __________.	gaseous substance
6.	A substance can be a __________, a liquid, or a gas. Not all substances are solids. Not all substances are gases. Not all substances are __________.	solid liquids
7.	Everything that has weight is a substance. Wood has __________, and is therefore a __________.	weight substance
8.	All substances have weight. Water is a substance. It has __________. Air is a __________. Air has __________.	weight substance weight

A PROGRAMED INTRODUCTION TO THE PERIODIC CHART OF THE ATOMS

ELTON R. LASH, Programed Instruction Dept., Welch Scientific Co.

Published by THE WELCH SCIENTIFIC Co.,
1515 Sedgwick St., Chicago 10, Illinois

Programed text, 130 frames, paperback, 16 pp., 8 1/2" x 11", package of 25, $6.25.
Teachers Manual included.
Index.
Final Test included.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Three revisions, Field test population - 224 junior and senior High School students."
Prerequisites:
Additional material required: 1 - Periodic Chart of the Atoms, Welch No. 4854, $7.50 ea.
Average Time: 1 hour (est.).
Next Revision:
(1 sample page)

SCIENCE-CHEMISTRY

A PROGRAMED INTRODUCTION TO THE PERIODIC CHART OF THE ATOMS
Lash; THE WELCH SCIENTIFIC CO.
one sample page:

PLEASE USE THE PERIODIC CHART OF THE ATOMS TO AID YOU IN THE FOLLOWING SECTION.

Oxygen has an atomic number (Black Numeral) of (18) .

The (19) number of O (Oxygen) indicates that one atom of oxygen contains (20) protons in its nucleus.

Oxygen (O) also contains 8 minus charges called (21) in its shells.

18
xxxxxxxxxxxxxxxxxx
eight (8)

19
xxxxxxxxxxxxxxxxxx
atomic

20
xxxxxxxxxxxxxxxxxx
eight (8)

21
xxxxxxxxxxxxxxxxxx
electrons

SECONDARY SCIENCE SERIES-CHEMISTRY: MATTER & CHEMICAL CHANGE

BARBARA BOWMAN

GAYLA GLASCOCK, both of Teaching Materials Corporation.

Published by TEACHING MATERIALS CORPORATION,
575 Lexington Avenue, New York 22, N.Y.

Programed text, 3,181 frames, paperback, 702 pp., 8 1/2" x 11", bound in 3 separate volumes, $16.00.

For use in MIN/MAX II machine, $25.00; program reusable, $15.00.

Teacher's Manual: General Manual for all TMI-Grolier programs available.

Table of Contents.

Final Test included.

Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "9th graders, age 14 years."

Prerequisites:

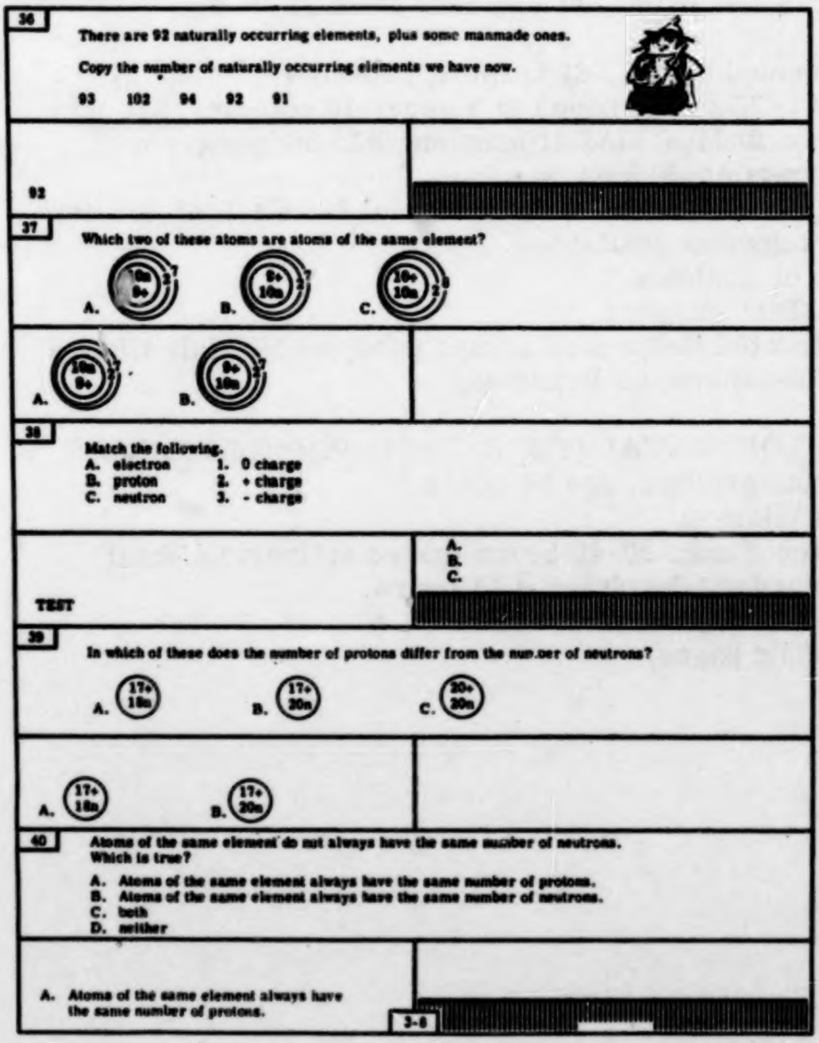
Average Time: 20-40 hours (based entirely on data); standard deviation, 8.13 hours.

Next Revision: March, 1964.

(3 sample pages)

SCIENCE-CHEMISTRY

SECONDARY SCIENCE SERIES - CHEMISTRY:
MATTER & CHEMICAL CHANGE
Bowman, Glascock; TEACHING MATERIALS CORPORATION
3 sample pages:



36

There are 92 naturally occurring elements, plus some manmade ones.

Copy the number of naturally occurring elements we have now.

93 102 94 92 91

92

37

Which two of these atoms are atoms of the same element?

A. 10n 8+ 2 7
B. 8+ 10n 2 7
C. 10+ 10n 2 8

A. 10n 8+ 2 7
B. 8+ 10n 2 7

38

Match the following.

A.	electron	1.	0 charge
B.	proton	2.	+ charge
C.	neutron	3.	- charge

TEST

A.
B.
C.

39

In which of these does the number of protons differ from the number of neutrons?

A. 17+ 18n
B. 17+ 20n
C. 20+ 20n

A. 17+ 18n
B. 17+ 20n

40

Atoms of the same element do not always have the same number of neutrons.
Which is true?

A. Atoms of the same element always have the same number of protons.
B. Atoms of the same element always have the same number of neutrons.
C. both
D. neither

A. Atoms of the same element always have the same number of protons.

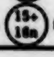
3-8

56

The atomic number of an element is equal to the number of protons in the nuclei of its atoms.

The atomic number of an atom having this nucleus

is 70.

The atomic number of an atom having this nucleus 

is (   ).

15

57

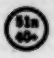
The number of protons in the nuclei of the atoms of an element is equal to

the __________ __________ of that element.

atomic number

58

This is the nucleus of an atom of one of the elements.



A. How many protons does it have?

B. What is its atomic number?

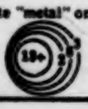
A. 40
B. 40

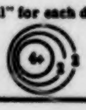
A.

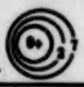
B.

59

Write "metal" or "nonmetal" for each diagram.

A. 

B. 

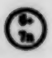
C. 

A. metal
B. metal
C. nonmetal

A.
B.
C.

60

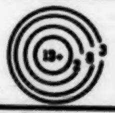
The nucleus of this atom shows that the element made up of such atoms has an atomic number of (   ).

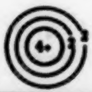


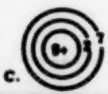
6

156

Write "metal" or "nonmetal" for each diagram.

A. 

B. 

C. 

A. metal
B. metal
C. nonmetal

A.
B.
C.

157

A certain atom has 24 neutrons and a mass number of 45. How many protons does it have?

21

158

RIDDLE

I am one of three atoms.
We all have the same atomic number.
We have different numbers of neutrons.
What are we called?

We are isotopes.

159

Isotopes have the same number of protons.
Which of these is also true?

A. Isotopes have the same mass numbers.
B. Isotopes have the same atomic numbers.
C. both
D. neither

B. Isotopes have the same atomic numbers.

160

An atom that has borrowed two electrons has a ( )( ) electrovalence.

-2

SCIENCE - CHEMISTRY H.S.-Coll.

SELECTED PRINCIPLES OF CHEMISTRY
JAY A. YOUNG, Professor of Chemistry, King's College
Published by PRENTICE-HALL, Inc.,
Englewood Cliffs, New Jersey.

Programed text, 1000 frames, paperback, 100 pp., 5" x 8", $2.95.
Table of Contents.
Constructed Responses usually used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"College chemistry students, freshman year."
Prerequisites: "None, beyond admittance to chemistry course."
Additional material required: "Slide rule, dictionary, metric ruler, paper clips, small coins, etc."
Average Time: 25 hours (based entirely on data); standard deviation: 55%.
Next Revision: "Uncertain."
(1 sample page)

SCIENCE-CHEMISTRY

SELECTED PRINCIPLES OF CHEMISTRY
Young; PRENTICE-HALL
one sample page:

Dynamic Equilibrium: Applications I

51

We know that the value of $[H_3O^+]$ is _____ mole/l. (Calculate this value from the given pH, 3.45; use your notebook. If you cannot solve for the answer here, go to step 51A, then 51B, and so on to 51G. If you obtained the correct answer, go to step 52.)

3.55×10^{-4}

51A

Since the pH is 3.45, we know that

$$\log [H_3O^+] = - \_\_\_\_\_$$

3.45

51B

Also, — 3.45 = +0.55 — 4.00

We could have said that — 3.45 = +0.12 → 3.57, or some other combination of positive and negative numbers. However, we choose to select a negative integer which is the next smallest integer, less than — 3.45. This integer is _____

—4.00

51C

Now we can say that $\log[H_3O^+] = +\_\_\_\_\_ - \_\_\_\_\_$

0.55 4.00

51D

The antilog of + 0.55 is _____.
(Find this number by using your slide rule.)

3.55

51E

The antilog of — 4.00 is ten to a negative integer power; it is _____.

10^{-4}

51F

The antilog of log $[H_3O^+]$ is _____.

$[H_3O^+]$

ACTION OF FORCES

LAURENCE WHISLER, Consultant in Programed Education, Central Scientific Co.

Published by CENTRAL SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

Planned for use in CENCO PROGRAMED LEARNER, $2.95; 100 frames, program included in price of machine.

Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Planned population of 100."

Prerequisites:

Average Time: 3 hours (est.).

Next Revision: September, 1963.

(1 sample page)

SCIENCE-PHYSICS

ACTION OF FORCES
Whisler; CENTRAL SCIENTIFIC CO.
one sample page:

ACTION OF FORCES

25. Complete the table of forces and distances:

F_1	D_1	F_2	D_2	
120		330	4	Lever system #5
18	4-1/2	9	9	Lever system #6
44	11		4	Lever system #7

The entries should be ________.
a) 11 and 121 b) 2 and 330 c) 165 and 4

. . . .

a

26. In the common problem of unbalanced levers where the clockwise torque, L_1, is either greater or smaller than the counterclockwise torque, L_2, one must find a third force which when properly applied balances the system. One must find the difference in torques, select a point of application of a balancing force, and finally determine the amount of the balancing force.

The paragraph indicates that torques may be ________.
a) divided b) squared c) subtracted

. . . .

c

26 1/2. The next problem deals with forces and distances expressed in metric units. The torque will, consequently, be expressed in kilogram meters.

. . . .

HYDROSTATICS
LAURENCE WHISLER, Consultant in Programed Education, Central Scientific Co.
Published by CENTRAL SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

Planned for use in CENCO PROGRAMED LEARNER, $2.95; 98 problem items, 19 pp., included in price of machine.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Planned population of 100."
Prerequisites: General Science.
Average Time: 3 hours (est.).
Next Revision: August, 1963.
(1 sample page)

SCIENCE-PHYSICS

HYDROSTATICS
Whisler; CENTRAL SCIENTIFIC CO.
one sample page:

HYDROSTATICS

88. Again use the hydrostatic principles relating pressure to the depth of a liquid. In fresh water, where h is the depth in feet and P is the pressure in pounds per square foot P 62.4 .
The per square foot pressure on the wall of dam 10 deet below the surface is 624 pounds; at 15 feet it is 936 pounds. At 7-1/2 feet the pressure in pounds per square foot is ________________.

a) 468 b) 1560 c) 3120

. . . .

a

89. Under certain not uncommon conditions the pressure of salt water P_s and of fresh water P_f in pounds per square foot at various depths is as follows:

P_s 64.0 h

P_f 62.4 h

What will be the pressure for mixtures of salt water and fresh water? The pressure will be ____________.

a) the same as for salt water
b) the same as for fresh water
c) intermediate

. . . .

c

SCIENCE-PHYSICS H.S.-Coll.

A PROGRAMED INTRODUCTION TO VECTORS
ROBERT CARMAN, Dept. of Physics, San Bernardino Valley College
Published by JOHN WILEY & SONS, Inc.,
605 Third Avenue, New York 16, N.Y.

Programed text, Paper (Spiral-Bound), 160 pp., 6" x 9", $2.75.
Teacher's Manual available, free.
Table of Contents.
Unit and Final and Diagnostic Test(s) included.
Branching always used; Multiple Choice Responses usually used; some Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "High School Students (advanced 11th grade math and physics) tech. Institute, 4 year engineering college, secondary teachers taking college work to teach PSSC material."
Prerequisites: "Elementary geometric concepts (angle, parallelism, etc.) are assumed to be understood." (from Preface)
Average Time:
Next Revision:
(1 sample page)

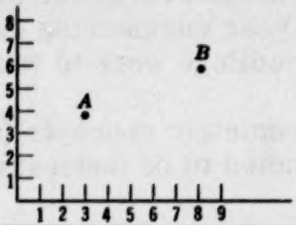
SCIENCE-PHYSICS

A PROGRAMED INTRODUCTION TO VECTORS
Carman; JOHN WILEY & SONS
one sample page:

19A **From p. 23A**

You are correct. (4, 1, 7) is certainly not a two-dimensional vector. Since it is a group of three ordered numbers it has three components and is a three-dimensional vector.

In the familiar Cartesian coordinate system each point on the plane is labeled with a pair of numbers. In the graph shown point *A* is (3, 4). We may say that every point on the plane has a vector "associated" with it. The vector (3, 4) is associated with point *A*. What vector is associated with point *B*?



a. (8, 6) **see page 22B**
b. (6, 8) **see page 24B**
c. (7, 6) **see page 25C**

22B **From p. 19A**

Right you are.

Let's digress for a little graph-reading practice to sharpen you for the labors ahead.........

24B **From p. 19A**

You answered that the vector associated with point *B* is (6, 8). Perhaps you have forgotten the convention used in specifying the coordinates of a point. The *x* coordinate value (the abcissa or horizontal axis) is placed first and the *y* coordinate (ordinate or vertical axis) is placed second in the parenthesis. Apparently you have not followed this convention.

Return to page 19A and try again.

25C **From p. 19A**

You answered that the vector associated with point *B* is (7, 6).

Oops! Looks like you misread the graph. Return to page 19A and give it another try.

SCIENCE-PHYSICS H.S.-Coll.

VECTORS
A Programmed Text for Introductory Physics
PETER FEIBLEMAN
BARBARA STOCKING
DAVID DAWSON
FRANCIS MECHNER, all of Basic Systems, Inc.
Published by: APPLETON-CENTURY-CROFTS, LYONS & CARNAHAN,
34 West 33rd Street, New York 1, N.Y.

Programed text, 496 frames, paperback, 175 pp., 6" x 9", $2.20.
For use in KONCEPT-O-GRAPH machine, program reusable, $5.60 and GRAFLEX MICRO-AID, program reusable.
Teacher's Manual available, free upon adoption of 10 or more of the program.
Table of Contents.
Unit and Final Test(s) available, "student final exams free upon adoption of program."
Constructed Responses usually used; some Multiple Choice; no Branching.

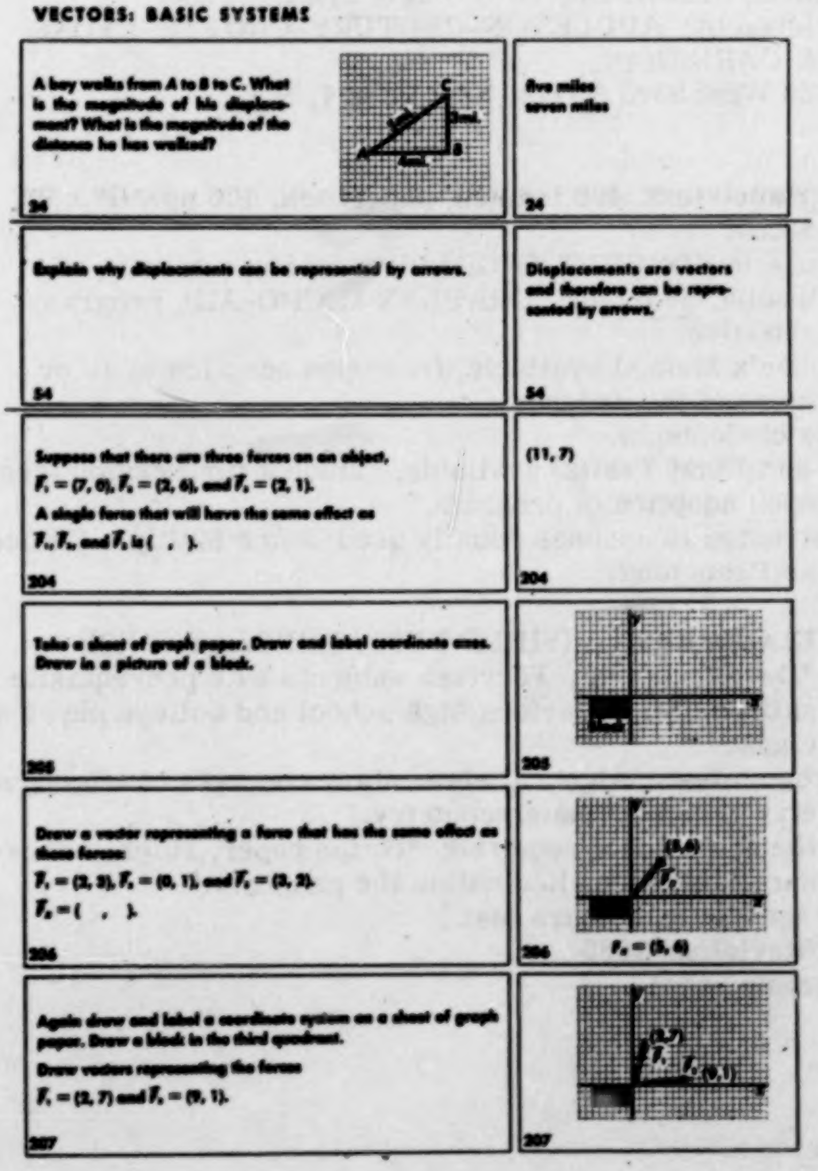
DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Developmental: Fourteen subjects with prerequisite skills. Field: Various high school and college physics classes."
Prerequisites: "Algebra, elementary concepts of trigonometry and coordinate geometry."
Additional material required: "Graph paper, ruler—necessary tables supplied within the program."
Average Time: 8 hours (est.).
Next Revision: 1965
(1 sample page)

SCIENCE-PHYSICS

VECTORS

Feibleman, Stocking, Dawson, Mechner; APPLETON-CENTURY-CROFTS, LYONS

one sample page:



VECTORS: BASIC SYSTEMS

A boy walks from A to B to C. What is the magnitude of his displacement? What is the magnitude of the distance he has walked? 24	five miles seven miles 24
Explain why displacements can be represented by arrows. 54	Displacements are vectors and therefore can be represented by arrows. 54
Suppose that there are three forces on an object, $\vec{F}_1 = (7, 0)$, $\vec{F}_2 = (2, 6)$, and $\vec{F}_3 = (2, 1)$. A single force that will have the same effect as $\vec{F}_1$, $\vec{F}_2$, and $\vec{F}_3$ is (,). 204	(11, 7) 204
Take a sheet of graph paper. Draw and label coordinate axes. Draw in a picture of a block. 205	205
Draw a vector representing a force that has the same effect as these forces: $\vec{F}_1 = (2, 3)$, $\vec{F}_2 = (0, 1)$, and $\vec{F}_3 = (3, 2)$. $\vec{F}_s = (\; , \;)$. 206	206 $\vec{F}_s = (5, 6)$
Again draw and label a coordinate system on a sheet of graph paper. Draw a block in the third quadrant. Draw vectors representing the forces $\vec{F}_1 = (2, 7)$ and $\vec{F}_2 = (9, 1)$. 207	207

LEARNING AND HUMAN ABILITIES
(An Adjunct Program for the Text.)
RICHARD E. RIPPLE
HERBERT J. KLAUSMEIER, both Dept. of Educational Psychology.
Published by HARPER & ROW,
49 East 33rd St., New York 16, N. Y.

Programed text, 3,000 frames, paperback, 336 pp., 8-1/2" x 11", $3.50.
Table of Contents.
Constructed Responses and Multiple Choice usually used; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Students enrolled in educational psychology at the Univ. of Wisconsin. Second semester, 1961-62."
Prerequisites:
Average time: 50 hours (est.).
Next revision: 1966.
(2 sample pages)

SCIENCE-PSYCHOLOGY

LEARNING AND HUMAN ABILITIES
Ripple, Klausmeier; HARPER & ROW
2 sample pages:

COMPLETION ITEMS

CHAPTER 6 COGNITIVE LEARNING OUTCOMES I: FACTS AND CONCEPTS

A. THE NATURE OF FACTS, CONCEPTS, AND KNOWLEDGE—Facts—Concepts

1. Something that has happened—an event, an actual state of affairs—is a [   ].

fact

2. The meaning that the individual associates with words, other signs, and direct sensory experiences is a [   ].

concept

3. Concepts are not formed in the absence of facts; however, facts may be memorized and recalled without associating [me   ] with them.

meaning

4. The meaningfulness of a concept depends upon previous associations with and [di   ] of the events or objects which the concept embodies.

discriminations

5. The calling of a word or number by a certain name is a fact or an arbitrary [as   ].

association

6. Rather than trying to explain to a child why "threw" and "through" are spelled the way they are, it is better to accept these as [   ] to be learned as such.

facts

7. The names given to the parts of speech are likewise [   ] to be accepted.

facts

8. Once we accept the fact that "noun" is a word, we can proceed with acquiring the [co   ] of noun as a word used to name a person, place, or thing.

concept

9. The child's giving the correct name of each digit is an example of learning accepted [   ].

facts

RECOGNITION ITEMS

PART II ACHIEVING LEARNING OUTCOMES EFFICIENTLY

CHAPTER 6 COGNITIVE LEARNING OUTCOMES I: FACTS AND CONCEPTS

A. THE NATURE OF FACTS, CONCEPTS, AND KNOWLEDGE—Facts—Concepts

1. Something that has happened—an event, an actual state of affairs—is a [concept, fact].

fact

---

2. The meaning that the individual associates with words, other signs, and direct sensory experiences is a [concept, thought].

concept

---

3. Concepts are not formed in the absence of facts; however, facts may be memorized and recalled without associating [experience, meaning] with them.

meaning

---

4. The meaningfulness of a concept depends upon previous associations with and [discriminations, integrations] of the events or objects which the concept embodies.

discriminations

---

5. The calling of a word or number by a certain name is a fact or arbitrary [action, association].

association

---

6. Rather than trying to explain to a child why "threw" and "through" are spelled the way they are, it is better to accept these as [concepts, facts] to be learned as such.

facts

---

7. The names given to the parts of speech are likewise [facts, truths] to be accepted.

facts

---

8. Once we accept the fact that "noun" is a word, we can proceed with acquiring the [concept, fact] of noun as a word used to name a person, place, or thing.

concept

---

9. The child's giving the correct name of each digit is an example of learning accepted [facts, ideas].

facts

PHYSIOLOGICAL PSYCHOLOGY
An Introductory Psychology Unit
DR. DANIEL P. KIMBLE, Stanford Medical Center

Published by ADDISON-WESLEY Publishing Co., Reading Mass.

Programed text, 1500 frames, paperback, 200 pp. 8 1/2" x 11", $4.50.
Teacher's Manual available.
Table of Contents
Diagnostic, Unit, Final Test(s) available. More than one equivalent form of each test available.
Constructed and Multiple Choice Responses usually used; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Some control groups and high school seniors."
Prerequisites: Average intelligence.
Average Time: 15-20 hours (est.).
Next Revision: "When needed."
(1 sample page)

SCIENCE-PSYCHOLOGY

PHYSIOLOGICAL PSYCHOLOGY
Kimble; ADDISON-WESLEY
one sample page:

KIMBLE PHYSIOLOGICAL PSYCHOLOGY

430. The intensity of stimuli in the world is translated by the sensory neurons into a ______ code.	frequency
431. The frequency of nerve impulses in a sensory neuron will ______ (increase/decrease) as the intensity of the stimulus increases.	increase
432. The reason that a stronger stimulus produces more impulses in a ______ neuron than a weaker one, is because the ______ stimulus can fire the neuron during the relative refractory period.	sensory strong
433. Look at Figure 15. Figure 15 illustrates the changes in the threshold of a neuron before, during, and after the neuron has conducted a ______ impulse.	nerve
434. As you can see from Figure 15, the threshold of the neuron is ______ (raised/lowered) during the relative refractory period.	raised

AFRICA
The Awakening Giant
B. JEAN ANWYLL, Head Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.) including 3 programs; program reusable, $2.00-$2.50.
Multiple Choice Responses sometimes used; some Branching; no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Private and public schools,".
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

SOCIAL STUDIES

AFRICA
Anwyll; HONOR PRODUCTS COMPANY
one sample page:

One of the most interesting things about the continent of Africa is that it is one tremendous chunk of rock. Of course, there is now soil on top of the rock, but the base of Africa is probably the biggest in the world. Africa is a whole continent of one big ______________.	rock (Remember that whenever I say that Africa is a rock, I mean the base of Africa is rock and there is soil on top.)
The area of Africa is one-fifth of all the land on earth. There is only one continent larger than Africa, and this is Asia. So, the enormous chunk of rock that is Africa is: a. the largest continent. b. the second largest continent. Press and hold the button of your choice. Do not be disturbed if you skip some of the material.	a.
No. Asia is the largest continent on earth. The enormous chunk of rock that is Africa is: a. the largest continent. b. the second largest continent. Press and hold the button of your choice.	b.
Right you are! Africa is the second largest continent and makes up one-fifth of all the land area on the earth.	No answer needed
Our awakening Giant is as big as the United States, Western Europe, China, and India all put together. The Sahara Desert, which is in northern Africa, is as big as the United States. Africa makes up ________- __________ of all the land area on earth.	one-fifth

SOCIAL STUDIES Jr. H.S.

THE BILL OF RIGHTS
MARIANA ROCA, Programer, Learning Incorporated
Published by CORONET INSTRUCTIONAL FILMS,
65 E. So. Water Street, Chicago 1, Illinois

Programed text, 304 frames, paperback, 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Data incomplete as of February 8, 1963."
Prerequisites: Grade 8 reading level.
Average Time: "Data incomplete as of February 8, 1963."
Next Revision: "Final revision scheduled for publication in summer, 1963."
(1 sample page)

SOCIAL STUDIES

THE BILL OF RIGHTS
Roca; CORONET INSTRUCTIONAL FILMS
one sample page:

ARTICLE VIII.

Excessive bail shall not be required nor excessive fines imposed, nor cruel and unusual punishments inflicted.

8-4 Article VIII includes some rights that are guaranteed to people who are accused of federal crimes. The first part of Article VIII says: "Excessive ________ shall not be required..."	bail •
8-5 Bail applies only in criminal cases. Bail is an amount of money that is set by a judge. After a person is arrested, he may go home to await trial if he pays the amount of money that the judge sets for b________.	bail •
8-6 Bail is not a punishment. It is to insure that the person will appear for trial. Bail applies only in ________ cases.	criminal •
8-7 The judge cannot set the bail at an amount of money that is greater than the person can reasonably afford to pay. Excessive means "too much" and Article VIII forbids ________ bail.	excessive •
8-8 Bob Lewis broke into a grocery store to steal some milk and bread because he had no money with which to buy food. He was caught and arrested. The judge set the bail at $50,000. This amount was much more than Bob could ever afford to pay. This was ________ bail, and is forbidden by Article ___.	excessive VIII •

CHINA: A PROGRAMED UNIT IN GEOGRAPHY
Southeast Asia: A Programed Unit in Geography.
T. SOENS,
E. HARR,
H. MAVRINAC,
F. RIFUGIATO,
P. DREIBELBIS, all social studies teachers, Pittsburgh Public Schools
H. KLINE, Geography Dept., University of Pittsburgh.
Published by HOLT, RINEHART AND WINSTON, Inc.,
383 Madison Avenue, New York 17, N. Y.

Programed text, 575 frames, paperback, 112 pp., 8-1/4" x 11", $.80.
Teacher's Manual available, free.
Table of Contents.
Constructed Responses usually used, some Multiple Choice, no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Programs were tested with individual students in cooperation with the Center for Programed Instruction. Frames revised and re-revised according to student responses.
Prerequisites:
Average Time: 6-7 hours (est.).
Next Revision: 1965.
(1 sample page)

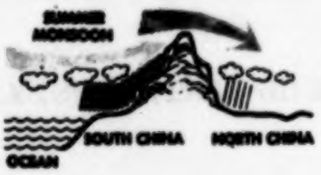
SOCIAL STUDIES

CHINA: A PROGRAMED UNIT IN GEOGRAPHY

Soens, Harr, Mavrinac, Rifugiato, Dreibelbis, Kline;
HOLT, RINEHART AND WINSTON
one sample page:

224

rainfall, rain, or moisture
summer



The summer, or wet, monsoon is partially blocked by the .... Mountains and as a result brings [less / more] rain to North China than it does to South China.

225

Chin Ling
less

Rice requires plenty of water. It [is / is not] a suitable crop for most of North China.

226

is not

In South China there is heavy rainfall in the [winter / summer].

227

summer

The rainfall from the summer, or [wet / dry], monsoon is greater in [South / North] China.

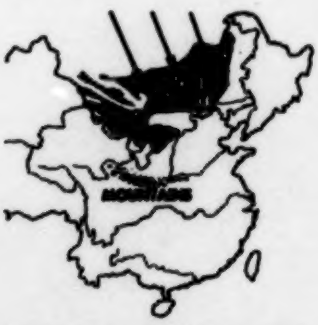
228

wet
South

(Review) The Gobi is one of the two principal deserts in Greater China. The other is the .... - .... Desert, located on the floor of the .... Basin in the region of ....

229

Takla-Makan
(TAH-*klah*-*mah*-KAHN)
Tarim
Sinkiang



In *winter*, the monsoon winds blow from the .... (direction), across the [Takla-Makan / Gobi] Desert.

1-20-63 Soens: Geography of China—Holt, Rinehart & Winston—National 4540

SOCIAL STUDIES 8th Grade +

THE CONSTITUTION
GINN AND COMPANY
Published by GINN AND COMPANY
Statler Building, Back Bay P.O. 191, Boston 17, Mass.

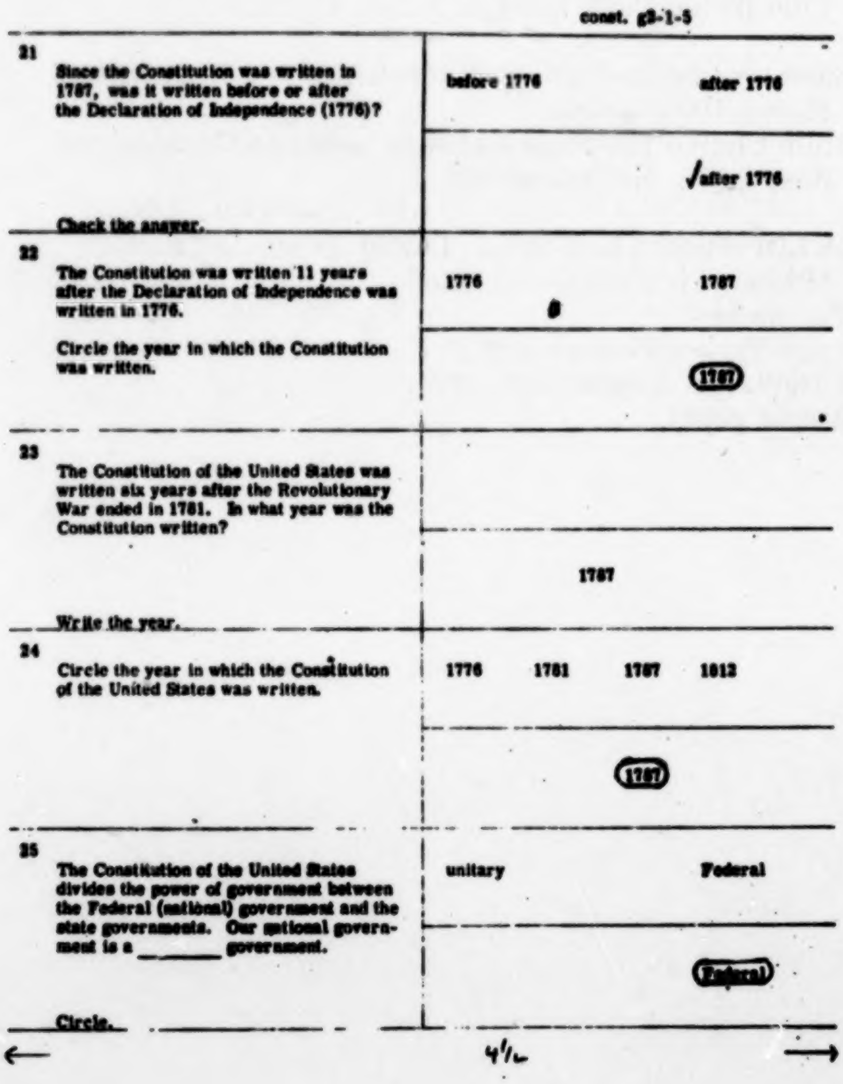
Programed text, 600 frames, paperback, 122 pp., 8 1/2" x 11", $_____.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

Prerequisites:
Additional Material required: Program Binder with Sliding mask.
Average Time: 15 hours (est.).
Next Revision:
(1 sample page)

SOCIAL STUDIES

THE CONSTITUTION
Ginn and Company; GINN AND COMPANY
one sample page:



const. g3-1-5

21 Since the Constitution was written in 1787, was it written before or after the Declaration of Independence (1776)?	before 1776 after 1776
Check the answer.	✓after 1776
22 The Constitution was written 11 years after the Declaration of Independence was written in 1776.	1776 1787
Circle the year in which the Constitution was written.	[✓ 1787]
23 The Constitution of the United States was written six years after the Revolutionary War ended in 1781. In what year was the Constitution written?	
Write the year.	1787
24 Circle the year in which the Constitution of the United States was written.	1776 1781 1787 1812
	[✓ 1787]
25 The Constitution of the United States divides the power of government between the Federal (national) government and the state governments. Our national government is a ________ government.	unitary Federal
Circle.	[✓ Federal]

← 4½ →

CONSTITUTION OF THE UNITED STATES
LAURENCE WHISLER, Consultant in Programed Education, Central Scientific Co.
Published by CENTRAL SCIENTIFIC Company, 1700 Irving Park Road, Chicago 13, Ill.

Planned for use in CENCO PROGRAMED LEARNER, $2.95; 100 frames.
Multiple Choice Responses always used; no Constructed Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Planned population of 100."
Prerequisites:
Average Time: 3 hours (est.).
Next Revision: September, 1963.
(1 sample page)

SOCIAL STUDIES

CONSTITUTION OF THE UNITED STATES
Whisler; CENTRAL SCIENTIFIC CO.
one sample page:

CONSTITUTION OF THE UNITED STATES

157. He shall ___a___ give to the Congress information ___b___, and recommend to their consideration such measures as he shall ___c___.

The phrase below, goes in blank _____
OF THE STATE OF THE UNION

. . . .

___b___

158. He may, ___a___, convene both Houses or either of them. And ___b___, he may adjourn them to such time as ___c___.

The phrase below, goes in blank _____
HE SHALL THINK PROPER

. . . .

___c___

158-1/2 He shall receive ambassadors and other public ministers; He shall take ere that the laws be faithfully executed. And shall commission all officers of the United States.

. . . .

159. The judicial power of the United States shall be vested in one Supreme Court, And in such inferior courts as the Congress may from time to time ordain and establish.

An INFERIOR court is a ________court.
a) temporary b) lower c) military

. . . .

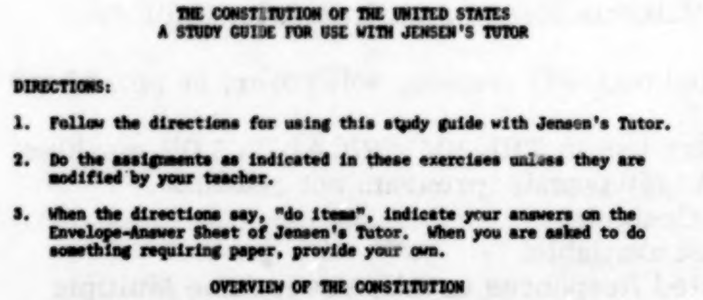
___b___

THE CONSTITUTION OF THE UNITED STATES
A Study Guide for Use with Jensen's Tutor
GERALD L. JENSEN, Coordinator of Secondary Education, Imperial County Schools.
Published by GERALD L. JENSEN,
1267 Wensely Avenue, El Centro, California

For use in JENSEN'S TUTOR, $3.00; Answer Sheets, $ .07 each; Key Inserts, $ .25 each.
Teacher's Manual available, $ .50.
Unit and Final Test(s) included.
Multiple Choice Responses always used; no Constructed Responses; no Branching.
DEVELOPMENTAL (FIELD TEST) POPULATION(S): Junior High School.
Prerequisites: None
Additional material required: Suitable text book.
Average Time:
Next Revision:
(1 sample page)

SOCIAL STUDIES

THE CONSTITUTION OF THE UNITED STATES
Jensen; GERALD L. JENSEN
one sample page:



THE CONSTITUTION OF THE UNITED STATES
A STUDY GUIDE FOR USE WITH JENSEN'S TUTOR

DIRECTIONS:

1. Follow the directions for using this study guide with Jensen's Tutor.
2. Do the assignments as indicated in these exercises unless they are modified by your teacher.
3. When the directions say, "do items", indicate your answers on the Envelope-Answer Sheet of Jensen's Tutor. When you are asked to do something requiring paper, provide your own.

OVERVIEW OF THE CONSTITUTION

Study the Preamble of the Constitution, then do items 3 and 4.

3. A. Posterity means succeeding generations or descendants taken collectively or together.
   B. Tranquility means disagreement and quarreling.
   C. A Constitution is a law passed by a lawmaking body such as Congress or a state legislature.
   D. Legal means of or pertaining to law.

4. A. Both of the following are purposes of the government established by the Constitution:
      1. To promote the welfare of all the people.
      2. To keep us and our children and our children's children free.
   B. According to the preamble of the Constitution the following are three of the purposes for which it was established:
      1. To form a better nation.
      2. To see that the people are treated fairly.
      3. To see that the people have freedom of speech and religion.
   C. As used in the Preamble of the Constitution, "We, the people of the United States" means, "We, the citizens of the United States."
   D. All the following are purposes of the government established by the Constitution:
      1. To be sure that there would be peace within the country.
      2. To provide for defense against enemies outside the country.
      3. To give the people freedom from fear.

List the titles of the eight main parts or articles of the Constitution from the text or reference you use. Leave enough space below each heading to permit you to state the heading in another way.

Do items 5 and 6.

5. A. "Amendments passed before 1800" would be a better primary heading for the Constitution than "Amendments to the Constitution."
   B. "The Senate" would be a better primary heading for the Constitution than "The Legislative Department" or "The House of Representatives."

EARTH IN ORBIT
(Geography, Part I)
PATRICK THORNHILL, Director of Methuen & Co.
Published by METHUEN & CO., LIMITED, London:
In U.S.A., FEARON PUBLISHERS, Inc.,
828 Valencia Street, San Francisco, California

Programed text, 327 frames, soft cover, 56 pp., 5" x 8", $1.25.
Planned for use in THE EMPIRICAL TUTOR machine, $600. 250 pounds; program not reusable.
Table of Contents.
Final Test available.
Constructed Responses usually used; some Multiple Choice; some Branching.

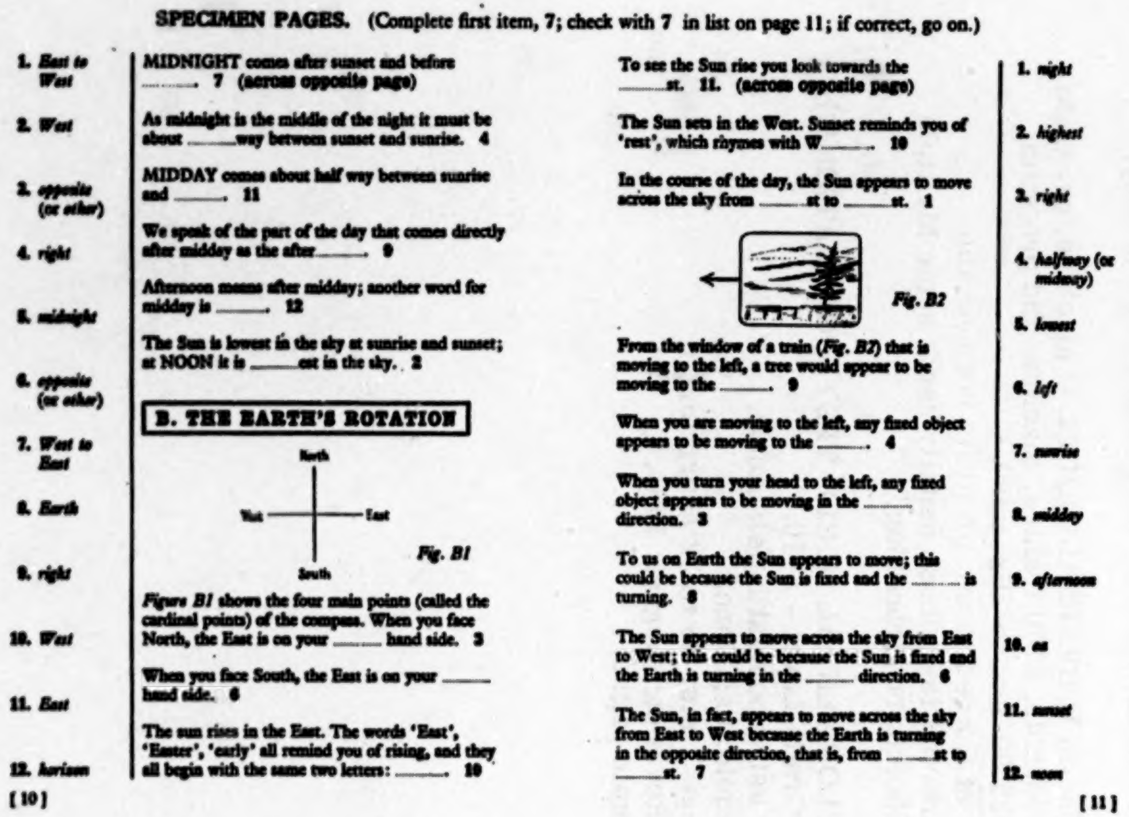
DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"A class of boys above normal intelligence, aged 12+. Classes tested by the Automated Teaching Research Unit of Aberdeen University. Classes both above and below normal intelligence in London schools."
Prerequisites: "Knowledge of: meaning of 'plane,' 'parallel,' 'perpendicular'; angular measurement in degrees; position of the continents and oceans; how to tell the time."
Additional material required: "...a globe is helpful."
Average Time: 4 hours (est.).
Next Revision: 1964.
(1 sample page)

SOCIAL STUDIES

EARTH IN ORBIT

Thornhill; METHUEN & CO., London; FEARON PUBLISHERS, U.S.A.

one sample page:



SPECIMEN PAGES. (Complete first item, 7; check with 7 in list on page 11; if correct, go on.)

MIDNIGHT comes after sunset and before ________. 7 (across opposite page)

As midnight is the middle of the night it must be about ________way between sunset and sunrise. 4

MIDDAY comes about half way between sunrise and ________. 11

We speak of the part of the day that comes directly after midday as the after________. 9

Afternoon means after midday; another word for midday is ________. 12

The Sun is lowest in the sky at sunrise and sunset; at NOON it is ________est in the sky. 2

B. THE EARTH'S ROTATION

Fig. B1

Figure B1 shows the four main points (called the cardinal points) of the compass. When you face North, the East is on your ________ hand side. 3

When you face South, the East is on your ________ hand side. 6

The sun rises in the East. The words 'East', 'Easter', 'early' all remind you of rising, and they all begin with the same two letters: ________. 10

- 1. *East to West*
- 2. *West*
- 3. *opposite (or other)*
- 4. *right*
- 5. *midnight*
- 6. *opposite (or other)*
- 7. *West to East*
- 8. *Earth*
- 9. *right*
- 10. *West*
- 11. *East*
- 12. *horizon*

[10]

To see the Sun rise you look towards the ________st. 11. (across opposite page)

The Sun sets in the West. Sunset reminds you of 'rest', which rhymes with W________. 10

In the course of the day, the Sun appears to move across the sky from ________st to ________st. 1

Fig. B2

From the window of a train (*Fig. B2*) that is moving to the left, a tree would appear to be moving to the ________. 9

When you are moving to the left, any fixed object appears to be moving to the ________. 4

When you turn your head to the left, any fixed object appears to be moving in the ________ direction. 3

To us on Earth the Sun appears to move; this could be because the Sun is fixed and the ________ is turning. 8

The Sun appears to move across the sky from East to West; this could be because the Sun is fixed and the Earth is turning in the ________ direction. 6

The Sun, in fact, appears to move across the sky from East to West because the Earth is turning in the opposite direction, that is, from ________st to ________st. 7

- 1. *night*
- 2. *highest*
- 3. *right*
- 4. *halfway* (or *midway*)
- 5. *lowest*
- 6. *left*
- 7. *sunrise*
- 8. *midday*
- 9. *afternoon*
- 10. *ea*
- 11. *sunset*
- 12. *noon*

[11]

SOCIAL STUDIES Elem.-H.S.

GEOGRAPHY OF THE UNITED STATES U-3006
UNIVERSAL ELECTRONICS LABORATORIES CORPORATION
Published by UNIVERSAL TEACHING MACHINE INSTITUTE,
510 Hudson Street, Hackensack, New Jersey.

For Use in UNIVERSAL MODEL U machine, program reusable, 2160 frames, machine and program, $25.00 (school discount).
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

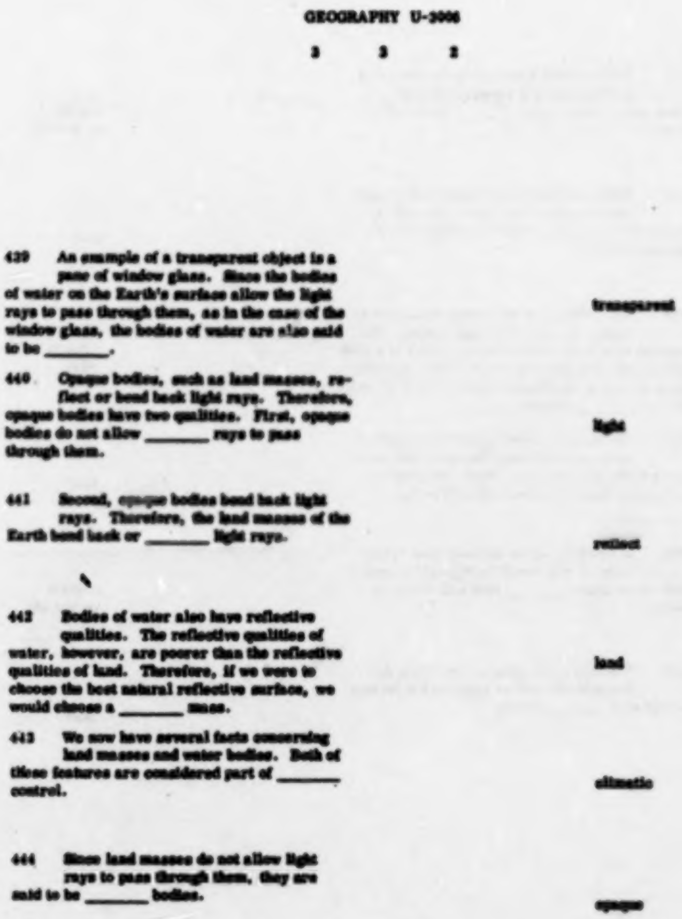
DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Grade Level - 5-10."
Other using population(s): Adult.
Prerequisites: None.
Average Time: 28 to 32 hours (est.).
Next Revision: August, 1963.
(2 sample pages)

SOCIAL STUDIES

GEOGRAPHY OF THE UNITED STATES U-3006

Universal Electronics Laboratories; UNIVERSAL TEACHING MACHINE INSTITUTE

2 sample pages:



GEOGRAPHY U-3006

3 3 2

439 An example of a transparent object is a pane of window glass. Since the bodies of water on the Earth's surface allow the light rays to pass through them, as in the case of the window glass, the bodies of water are also said to be _______.	transparent
440 Opaque bodies, such as land masses, reflect or bend back light rays. Therefore, opaque bodies have two qualities. First, opaque bodies do not allow _______ rays to pass through them.	light
441 Second, opaque bodies bend back light rays. Therefore, the land masses of the Earth bend back or _______ light rays.	reflect
442 Bodies of water also have reflective qualities. The reflective qualities of water, however, are poorer than the reflective qualities of land. Therefore, if we were to choose the best natural reflective surface, we would choose a _______ mass.	land
443 We now have several facts concerning land masses and water bodies. Both of these features are considered part of _______ control.	climatic
444 Since land masses do not allow light rays to pass through them, they are said to be _______ bodies.	opaque

457 Transmission determines the amount of heat an area will receive and hold. Land masses heat more ______ than water bodies.	rapidly or quickly
458 Bodies of water take longer to heat and longer to lose their heat. Therefore, water will ______ slower than land after the sun goes down.	cool
459 The climates of the United States are affected, in part, by transmission. The central area of the United States, which is a land mass, will heat and cool more rapidly than the area adjoining the Atlantic Ocean, which is known as the ______ Coastal ______.	Atlantic Plain
460 We may now reach several conclusions about land and water features with regard to climatic control. First, the feature to reach a higher temperature will be the ______.	land
461 In addition, since the land is an opaque body, it will reach its highest temperature much more ______ than will a body of water.	rapidly or quickly
462 Therefore, the greatest variation in temperature will be found on the feature known as a ______ mass.	land

SOCIAL STUDIES 6th & 7th Grade

GREAT THEMES IN AMERICAN HISTORY
1760-1860 and 1860-1960
DINNERSTEIN, Programer
ALEXANDER SCHURE, President, N. Y. Institute of Technology
Published by CENTRAL SCIENTIFIC Company,
1700 Irving Park Road, Chicago 13, Ill.

For use in CENCO PROGRAMED LEARNER, $2.95; program not reusable, 500 frames in each section, one section included in price of machine.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Over 200."
Prerequisites:
Average Time: 3 hours (est.).
Next Revision:
(1 sample page)

SOCIAL STUDIES

GREAT THEMES IN AMERICAN HISTORY
Dinnerstein, Schure; CENTRAL SCIENTIFIC CO.
one sample page:

GREAT THEMES IN AMERICAN HISTORY (1860-1960)

24. According to the Constitution, if the House of Representatives impeaches a President, the Senate must hold a trial to see is the President really has been ______ of committing a very serious crim.

. . . .

guilty

25. The highest judge in the country must preside over this trial. This is, of course, the Chief Justice of the __________ Court.

. . . .

Supreme

26. The ________ Of President Johnson did not last very long.

. . . .

trial

27. All of the members of the Senate who were able to vote did so, but they failed by one vote to sustain the __________ of the President.

. . . .

impeachment

28. Therefore, Johnson continued as President for the ____________ of his term of office

remainder, rest

SOCIAL STUDIES Elem.-H.S.

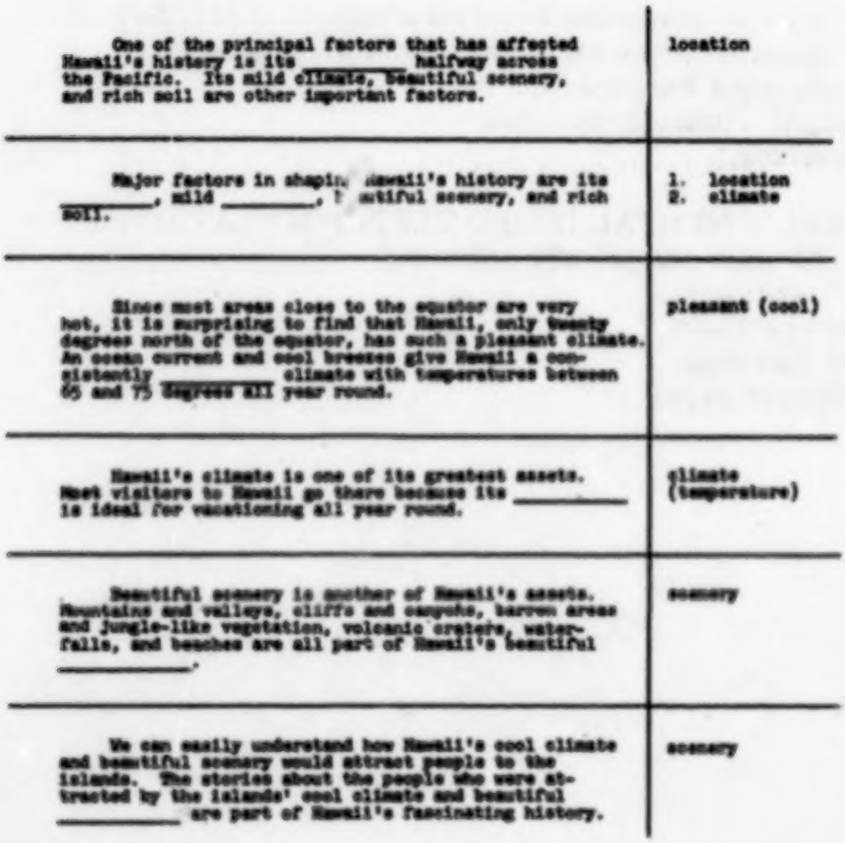
HAWAII—MORE THAN AN ISLAND PARADISE
ALICE WARREN, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.); program reusable, 200 frames, $2.00-$2.50. (Machine may be marketed in retail channels at this $20 combination price including 3 or 4 programs.)
Constructed Responses:
Multiple Choice Responses:
Branching:

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time:
Next Revision:
(1 sample page)

SOCIAL STUDIES

HAWAII—MORE THAN AN ISLAND PARADISE
Warren; HONOR PRODUCTS COMPANY
one sample page:



One of the principal factors that has affected Hawaii's history is its ________ halfway across the Pacific. Its mild climate, beautiful scenery, and rich soil are other important factors.	location
Major factors in shaping Hawaii's history are its ________, mild ________, beautiful scenery, and rich soil.	1. location 2. climate
Since most areas close to the equator are very hot, it is surprising to find that Hawaii, only twenty degrees north of the equator, has such a pleasant climate. An ocean current and cool breezes give Hawaii a consistently ________ climate with temperatures between 65 and 75 degrees all year round.	pleasant (cool)
Hawaii's climate is one of its greatest assets. Most visitors to Hawaii go there because its ________ is ideal for vacationing all year round.	climate (temperature)
Beautiful scenery is another of Hawaii's assets. Mountains and valleys, cliffs and canyons, barren areas and jungle-like vegetation, volcanic craters, waterfalls, and beaches are all part of Hawaii's beautiful ________.	scenery
We can easily understand how Hawaii's cool climate and beautiful scenery would attract people to the islands. The stories about the people who were attracted by the islands' cool climate and beautiful ________ are part of Hawaii's fascinating history.	scenery

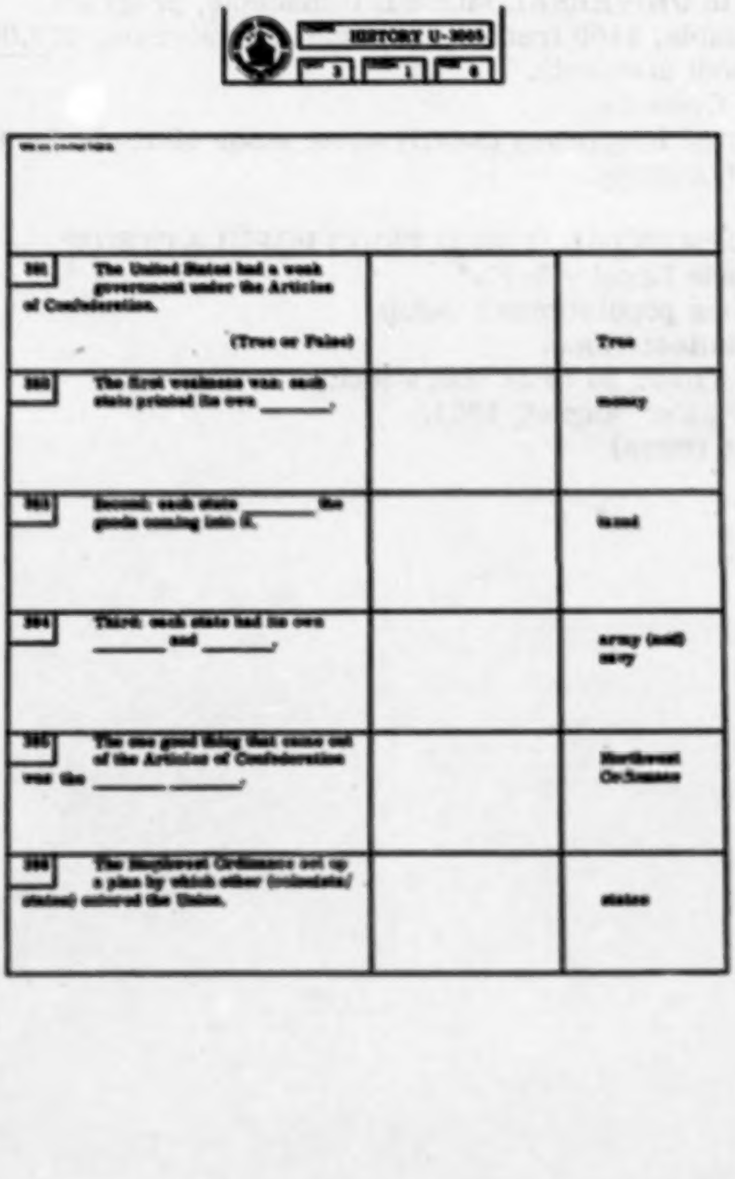
HISTORY OF THE UNITED STATES U-3005
UNIVERSAL ELECTRONICS LABORATORIES CORPORATION
Published by UNIVERSAL TEACHING MACHINE INSTITUTE,
510 Hudson Street, Hackensack, New Jersey.

For use in UNIVERSAL MODEL U machine, program reusable, 2160 frames, machine and program, $25.00 (school discount).
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Grade Level - 5-10."
Other using population(s): Adult.
Prerequisites: None.
Average Time: 28 to 32 hours (est.).
Next Revision: August, 1963.
(2 sample pages)

SOCIAL STUDIES

HISTORY OF THE UNITED STATES U-3005
Universal Electronics Laboratories; UNIVERSAL TEACHING MACHINE INSTITUTE
2 sample pages:



HISTORY U-3005

3 1 6

381 The United States had a weak government under the Articles of Confederation. (True or False)		True
382 The first weakness was: each state printed its own _______.		money
383 Second: each state _______ the goods coming into it.		taxed
384 Third: each state had its own _______ and _______.		army (and) navy
385 The one good thing that came out of the Articles of Confederation was the _______ _______.		Northwest Ordinance
386 The Northwest Ordinance set up a plan by which other (colonies/states) entered the Union.		states

HISTORY U-2000

3 | 5 | 1

505 We have now learned about two branches of government. The first branch, the ________, writes the laws.		Congress or legislature
506 The second branch of the national government is the executive, or ________ of the United States.		President
507 The third and final branch of the national government is the judicial branch of the government. The national government, therefore, is made up of three parts.	GO TO NEXT FRAME	
508 The first part, or legislative, is Congress. The second part, or executive, is the President. The third part is the ________		judicial
509 This third branch, the ________, reviews the laws.		judicial
510 The ________ branch reviews the laws to see that they agree with the supreme law of the land, the ________.		judicial Constitution

SOCIAL STUDIES 8th Grade+

HOW A BILL BECOMES LAW.
GINN & COMPANY
Published by GINN AND COMPANY
Statler Building, P.O. 191 Back Bay, Boston 17, Mass.

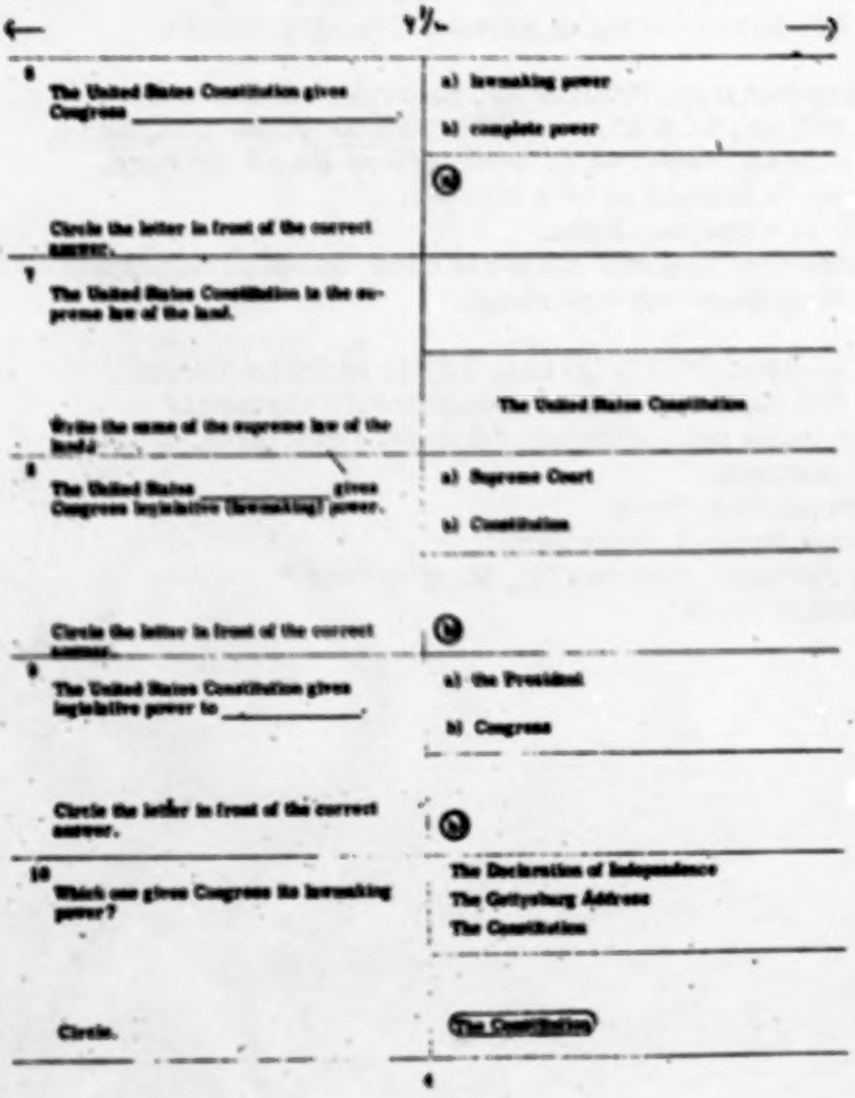
Programed text, 612 frames, paperback, 126 pp., 8 1/2" x 11", $______.
Table of Contents.
Constructed Responses always used; no Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):

Prerequisites:
Additional material required: Program Binder with sliding mask.
Average Time: 15 hours (est.).
Next Revision:
(1 sample page)

SOCIAL STUDIES

HOW A BILL BECOMES LAW
Ginn & Company; GINN AND COMPANY
one sample page:



← 4½ →

6 The United States Constitution gives Congress ______ ______. Circle the letter in front of the correct answer.	a) lawmaking power b) complete power ⓐ
7 The United States Constitution is the supreme law of the land. Write the name of the supreme law of the land.	The United States Constitution
8 The United States ______ gives Congress legislative (lawmaking) power. Circle the letter in front of the correct answer.	a) Supreme Court b) Constitution ⓑ
9 The United States Constitution gives legislative power to ______. Circle the letter in front of the correct answer.	a) the President b) Congress ⓑ
10 Which one gives Congress its lawmaking power? Circle.	The Declaration of Independence The Gettysburg Address The Constitution [✓ The Constitution]

SOCIAL STUDIES H.S.-Coll.+

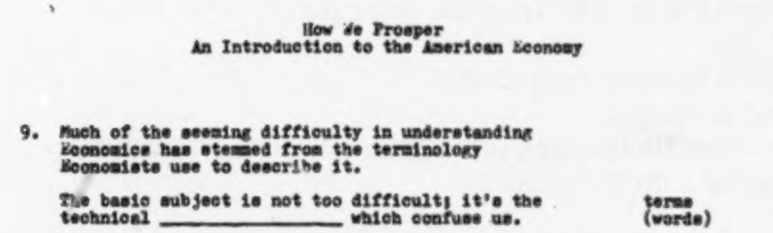
HOW WE PROSPER
An Introduction to the American Economy
MARSHALL VAN OSTROM, Director of Employee Development
Published by EDUCATIONAL METHODS, Inc.,
612 North Michigan Avenue, Chicago, Illinois.

Programed text, 700 frames, paperback & hardcover, 250 pp., 6" x 9", hardcover, $7.50; paperback, $3.50, may be issued as 16 units at less than $ .50 each.
Teacher's Manual to be available.
Table of Contents, Index.
Constructed Responses always used; no Multiple Choice Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S): "50 supervisory and management personnel."
Other using population(s): "Business executive, Adult education."
Prerequisites: None
Average time: 7 hours (est.).
Next revision: "1st edition, March, 1963."
(1 sample page)

SOCIAL STUDIES

HOW WE PROSPER
Van Ostrom; EDUCATIONAL METHODS
one sample page:



How We Prosper
An Introduction to the American Economy

9. Much of the seeming difficulty in understanding Economics has stemmed from the terminology Economists use to describe it.

The basic subject is not too difficult; it's the technical ______________ which confuse us. terms (words)

10. Stripped of fancy terminology, Economics can be simply stated and easily understood.

Breaking through the technical "word barrier" should greatly simplify and aid our understanding of ______________. Economic

11. For example, Monetization is an economist's word which simply means "giving a standard value to" as in a national currency.

At present, our currency has its "______________" in silver. monetisa'ion

12. When silver is "monetized" (as it is in the case of our currency) it is given a standard _______ for exchange purposes. value

13. Things other than precious metals (silver, gold) can be monetized also.

For example, when money is loaned on a borrower's note, (written promise to pay), this note can be ______________. monetized

14. The note can be monetized by giving it a _______ value. standard

Copyright 1963 Educational Methods, Inc.
612 North Michigan Avenue, Chicago, Ill.

SOCIAL STUDIES Sixth Grade

MAPS: HOW WE READ THEM
WINIFRED NEAL, Programer, Learning Incorporated
LLOYD L. HARING, Dept. of Geography, Arizona State University
Published by CORONET INSTRUCTIONAL FILMS,
65 E. So. Water Street, Chicago 1, Illinois

Programed text, 315 frames, paperback, 7" x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"...Small representative samplings at appropriate grade levels tested informally on one-to-one basis with programer. Small representative samplings under controlled conditions (Dukane Redi-tutor using 35 mm. film) for each revision of program. Program has been through 4 complete revisions as of February 8, 1963, based on data obtained from formal machine testing. Field testing plan: Classroom testing from 5th through 7th grades, administered by classroom teachers. Test areas distributed geographically from Florida to California. All testing conducted by Learning Incorporated."
Prerequisites: Grade 6 reading level.
Average Time: "Data incomplete as of Feb. 8, 1963."
Next Revision: "Final revision scheduled for publication in Spring, 1963."
(1 sample page)

SOCIAL STUDIES

MAPS: HOW WE READ THEM
Neal, Haring; CORONET INSTRUCTIONAL FILMS
one sample page:

3-22 A landform map tells you whether the land is rough or smooth. An elevation map tells you how far above or below ____ an area is.

sea level

●

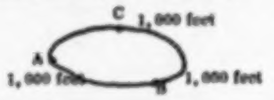
3-23
A. A map which shows distance above or below sea level.
B. A map which shows mountains, plateaus, plains, and hills.

A describes a(n) ________ map.
B describes a(n) ________ map.

elevation; landform

●

3-24 On an elevation map you see lines called contour lines. A contour line connects all the points that are the same elevation (distance from sea level).

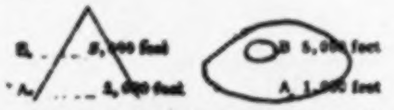


Cities A, B and C are connected by a contour line because they are all ________ (how many?) feet above sea level.

1,000

●

3-25 Elevation means how far above or below sea level a point is.

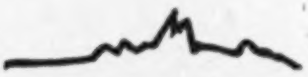


This mountain is 1,000 feet above sea level at point A near its base, and at point B near its peak, it is ________ feet above sea level.

5,000

●

3-26



We may find the same type of landform at different elevations, some plains may be at sea level and some may be at 2,500 feet above sea level. These differences would be shown on an ________ map.

elevation

●

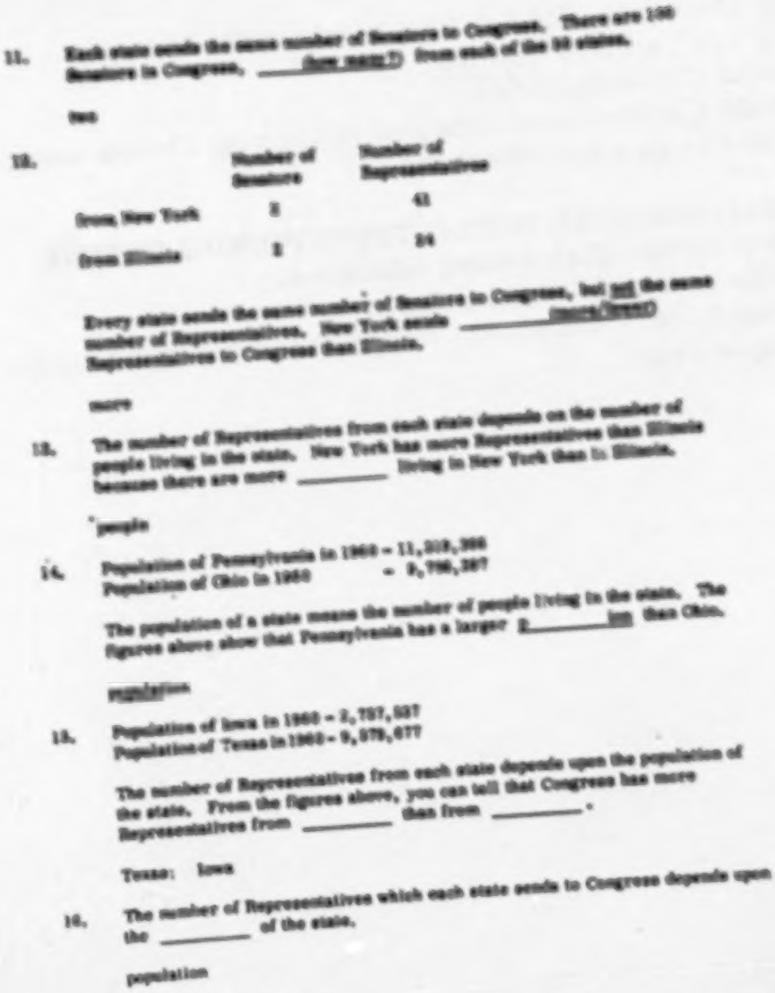
THE MEMBERS OF CONGRESS
SHEILA LEVINSKY, Programer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona.

Programed text, 32 frames, $.15.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL POPULATION(S): Grade 6.
Prerequisites: Grade 6 reading level.
Average Time: 26.6 minutes (based entirely on data); standard deviation, 3.5 minutes.
Next Revision: "The program is the final revision."
(1 sample page)

SOCIAL STUDIES

THE MEMBERS OF CONGRESS
Levinsky; LEARNING INCORPORATED
one sample page:



11. Each state sends the same number of Senators to Congress. There are 100 Senators in Congress, ________(how many?) from each of the 50 states.

two

12.

	Number of Senators	Number of Representatives
from New York	2	41
from Illinois	2	24

Every state sends the same number of Senators to Congress, but not the same number of Representatives. New York sends ____________(more/fewer) Representatives to Congress than Illinois.

more

13. The number of Representatives from each state depends on the number of people living in the state. New York has more Representatives than Illinois because there are more ________ living in New York than in Illinois.

people

14. Population of Pennsylvania in 1960 – 11,319,366
Population of Ohio in 1960 – 9,706,397

The population of a state means the number of people living in the state. The figures above show that Pennsylvania has a larger p__________ion than Ohio.

population

15. Population of Iowa in 1960 – 2,757,537
Population of Texas in 1960 – 9,579,677

The number of Representatives from each state depends upon the population of the state. From the figures above, you can tell that Congress has more Representatives from ________ than from ________.

Texas; Iowa

16. The number of Representatives which each state sends to Congress depends upon the ________ of the state.

population

PARLIAMENTARY PROCEDURE
WARREN LEHMAN, U.S.I. Educational Science Division.
Published by DOUBLEDAY & COMPANY, Inc.,
575 Madison Avenue, N.Y.C.

Programed text, 318 frames, hard cover, 344 pp.,
8 1/4" x 5 3/8", $4.95.
Table of Contents, Index.
Multiple Choice Responses and Branching always used;
no Constructed Responses.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites: High school education.
Average Time: 6-8 hours (est.).
Next Revision: "Dependent on publisher's requirements."
(1 sample page)

SOCIAL STUDIES

PARLIAMENTARY PROCEDURE
Lehman; DOUBLEDAY & COMPANY
one sample page:

Sample from Parliamentary Procedure

6
(from page 1)

YOUR ANSWER: Almost every organization follows essentially the same set of parliamentary rules.

This is true. Although many groups change the standard rules in one small way or another, the basic rules are used in almost all groups, from the local fraternal organization to the United Nations, and from the Parent-Teacher Association to the United States House of Representatives. Some vary the names for officers, some the order in which meetings are conducted, some the number of votes necessary to pass certain types of measures, but the differences are small compared to the similarities. Once learned, the rules of procedure should guide you in whatever organizational work you do.

One of the names that varies from organization to organization is that of the person who has the job of running the meeting. Generally, such a person may be called the presiding officer. The presiding officer of the Senate is the Vice-President of the United States. The presiding officer of the House of Representatives is called the Speaker of the House. Sometimes a presiding officer is called a chairman, moderator, or president. Whatever the name, though, the duties are much the same. The presiding officer, sometimes referred to impersonally as the chair, has the job of supervising the meetings of the organization. In one sense, the job of the chair is to see that the rules of procedure are followed.

But what is the purpose of these rules?

To keep order in the meeting.	page 9
To ensure that meetings are conducted as quickly as possible.	page 13
To ensure that organizations can achieve their purposes democratically.	page 16

SOCIAL STUDIES

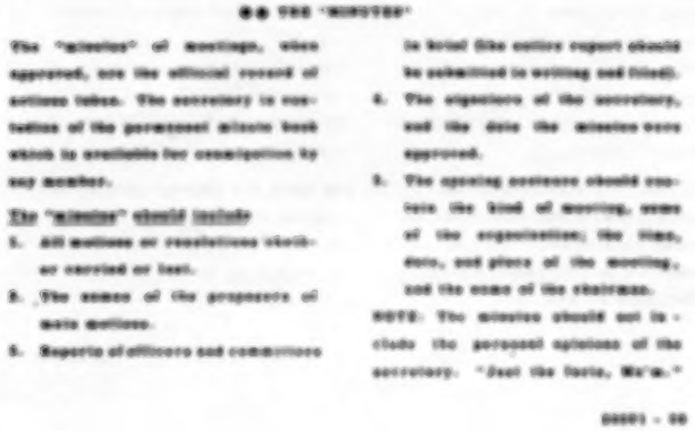
PARLIAMENTARY PROCEDURE 29
GEORGE M. SNYDER, Education Engineering, Inc.,
Published by EDUCATION ENGINEERING, Inc.,
301 West 7th Street, San Pedro, California.

Programed text, 3240 frames, paperback, 108 pp.,
5" x 7", available in 3 separate units at $3.75 each.
For use in SPEED machine, $30.00; program reusable.
Teacher's Manual available, $4.00 per unit.
Unit, Final, Diagnostic Test(s) available, $3.75 each.
Multiple Choice Responses always used; no Constructed
Responses; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Prerequisites:
Additional material required: SPEED machine, $700 &
$850.
Average Time: 5 hours (est.).
Next Revision:
(2 sample pages)

SOCIAL STUDIES

PARLIAMENTARY PROCEDURE 29
Snyder; EDUCATION ENGINEERING
2 sample pages:



THE "MINUTES"

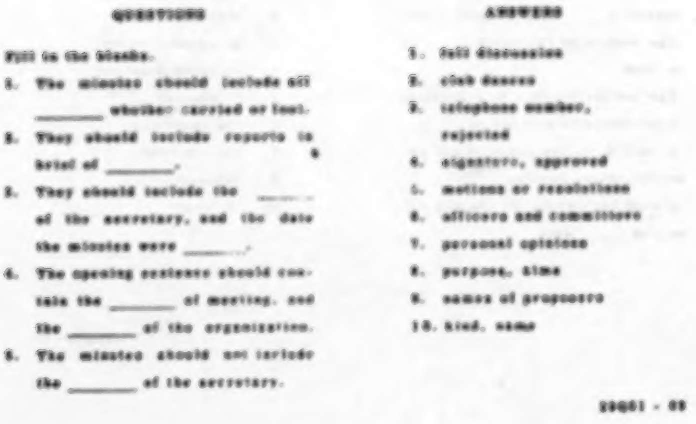
The "minutes" of meetings, when approved, are the official record of actions taken. The secretary is custodian of the permanent minute book which is available for examination by any member.

The "minutes" should include

1. All motions or resolutions whether carried or lost.
2. The names of the proposers of main motions.
3. Reports of officers and committees in brief (the entire report should be submitted in writing and filed).
4. The signature of the secretary, and the date the minutes were approved.
5. The opening sentence should contain the kind of meeting, name of the organization; the time, date, and place of the meeting, and the name of the chairman.

NOTE: The minutes should not include the personal opinions of the secretary. "Just the facts, Ma'am."

[illegible]



QUESTIONS

Fill in the blanks.

1. The minutes should include all ______ whether carried or lost.
2. They should include reports in brief of ______.
3. They should include the ______ of the secretary, and the date the minutes were ______.
4. The opening sentence should contain the ______ of meeting, and the ______ of the organization.
5. The minutes should not include the ______ of the secretary.

ANSWERS

1. full discussion
2. club dances
3. telephone number, rejected
4. signature, approved
5. motions or resolutions
6. officers and committees
7. personal opinions
8. purpose, time
9. names of proposers
10. kind, name

[illegible]

PRIVILEGED MOTIONS

The motion TO TAKE A RECESS allows an assembly to adjourn for a short time. After the recess, business resumes at the point where recess took place.

Second. No debate. Amendable as to time. Majority.

TO RISE TO A QUESTION OF PRIVILEGE relates to the needs of the assembly or a member, which require immediate action (heat, light, draft, noise, announcement, etc.).

Member: (not waiting for) "Mr. Chairman, I rise to a question of privilege."

Chairman: "State your question of privilege."

No second. No debate. Chairman decides.

TO CALL FOR ORDERS OF THE DAY reminds the chairman of business to be considered at that particular time.

No second. No debate. No vote.

[illegible]-17

QUESTIONS	ANSWERS
Fill in the blank.	
1. The motion to recess allows the assembly ____ for a short time.	1. no
2. The motion to recess is ____ as to time.	2. amendable
3. The motion to rise to a question of privilege is decided by ____.	3. majority
4. It relates to the needs of the assembly which require ____.	4. as regular order
5. A call for orders of the day requires ____ vote.	5. immediate action
	6. to adjourn
	7. the chairman
	8. the assembly
	9. debatable
	10. to rest

[illegible]-17

PROGRAMMED INSTRUCTION IN ECONOMICS
(5 Volumes)
Supply and Demand; National Income Accounting;
Theory of Income Determination; The Business Firm;
Theory of Production

LEIGH H. FERGUSON
ALBERT E. HICKEY
SANFORD M. AUTOR, all of Entelek, Inc.
Published by THE MACMILLAN COMPANY,
60 Fifth Avenue, New York, New York

Programed text, 400 frames each volume, paperback, 100 pp., 8-1/2" x 11, program bound in two separate units, $2.00.
Table of Contents.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"College and high school students."
Prerequisites: "Introductory Economics."
Average Time: 40 hours (est.).
Next Revision: 1965.
(1 sample page)

SOCIAL STUDIES

PROGRAMMED INSTRUCTION IN ECONOMICS
Ferguson, Hickey, Autor; THE MACMILLAN COMPANY
one sample page:

Recall from our discussion of the demand schedule and demand curve that, for each price, consumers are willing and able to purchase a given ________.

1

---

quantity — What would be the result if something happened to change the price? Well, if the price changes, the *quantity demanded* will ________.

2

---

change — Let's examine the effect of a price change on the quantity ________, using Figure 6 on page R5 [*see next page*].

3

---

demanded — In Figure 6, when the price is 35¢, the quantity demanded is ________ pounds per day.

4

40,000 — Still on the same graph, construct a *horizontal* line through 55¢. Construct a *vertical* line through 10,000 pounds.

5

In Figure 6, when the price is increased by 20¢, from 35¢ to ________¢, the *quantity demanded* is • • •.

6

55
10,000 pounds per day

SOCIAL STUDIES Elem.

OUR TWO NEWEST STATES
DARLENE HARING, Programer, Learning, Inc.
Published by LEARNING INCORPORATED,
1317 West Eighth Street, Tempe, Arizona

Programed text, 20 frames, $.15.
Constructed Responses always used; no Multiple Choice;
no Branching.

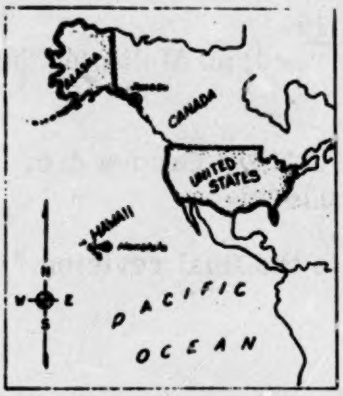
DEVELOPMENTAL POPULATION(S): Grades 4-6.
Prerequisites: Grade 5 reading level.
Average Time: 10 minutes (est.).
Next Revision: "The program is the final revision."
(1 sample page)

SOCIAL STUDIES

OUR TWO NEWEST STATES

Haring; LEARNING INCORPORATED

one sample page:



1. When Alaska and Hawaii were admitted to the United States, the number of states increased from 48 to ___.	50
2. Alaska and Hawaii are the two newest states. Alaska was the 49th state to be added. The 50th state was H_____.	Hawaii
3. Look at the map to find this answer. Both Alaska and Hawaii are farther __________ (east or west?) than our other states.	west
4. Neither Alaska nor Hawaii touches another state. Alaska borders on Canada. Hawaii is completely surrounded by the ________ Ocean. Look at the map to get the answer if necessary.	Pacific
5. Alaska and Hawaii have some things in common. They are our two newest states, they touch no other states, and they are farther ___________ (what direction?) than any other states.	west
6. Look at the map to answer this. The state that is farther north than any of the other states is _______.	Alaska
7. Look at the map. While Alaska and Hawaii are both west of the other states, the only state south of all the other states is _______	Hawaii

STUDY SKILLS

Jr. H.S.

BETTER STUDY HABITS
UNIVERSAL ELECTRONICS LABORATORIES CORPORATION
Published by UNIVERSAL TEACHING MACHINE INSTITUTE,
510 Hudson Street, Hackensack, New Jersey.

For use in UNIVERSAL MODEL U machine, program reusable, 552 frames, machine and program, $8.95 (school discount).
Constructed Responses always used; no Multiple Choice; no Branching.

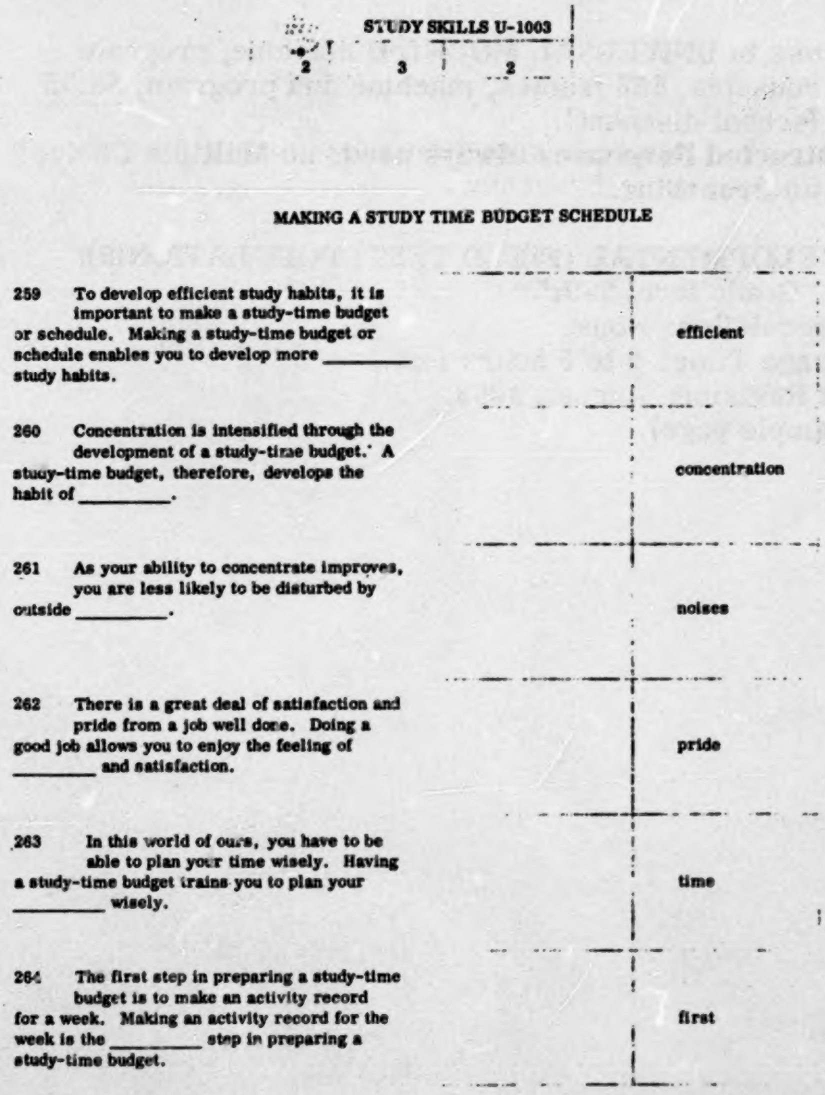
DEVELOPMENTAL (FIELD TEST) POPULATION(S): "Grade level 7-9."
Prerequisites: None.
Average Time: 3 to 5 hours (est.).
Next Revision: August, 1963.
(1 sample page)

STUDY SKILLS

BETTER STUDY HABITS

Universal Electronics Laboratories; UNIVERSAL TEACHING MACHINE INSTITUTE

one sample page:



STUDY SKILLS U-1003

2 3 2

MAKING A STUDY TIME BUDGET SCHEDULE

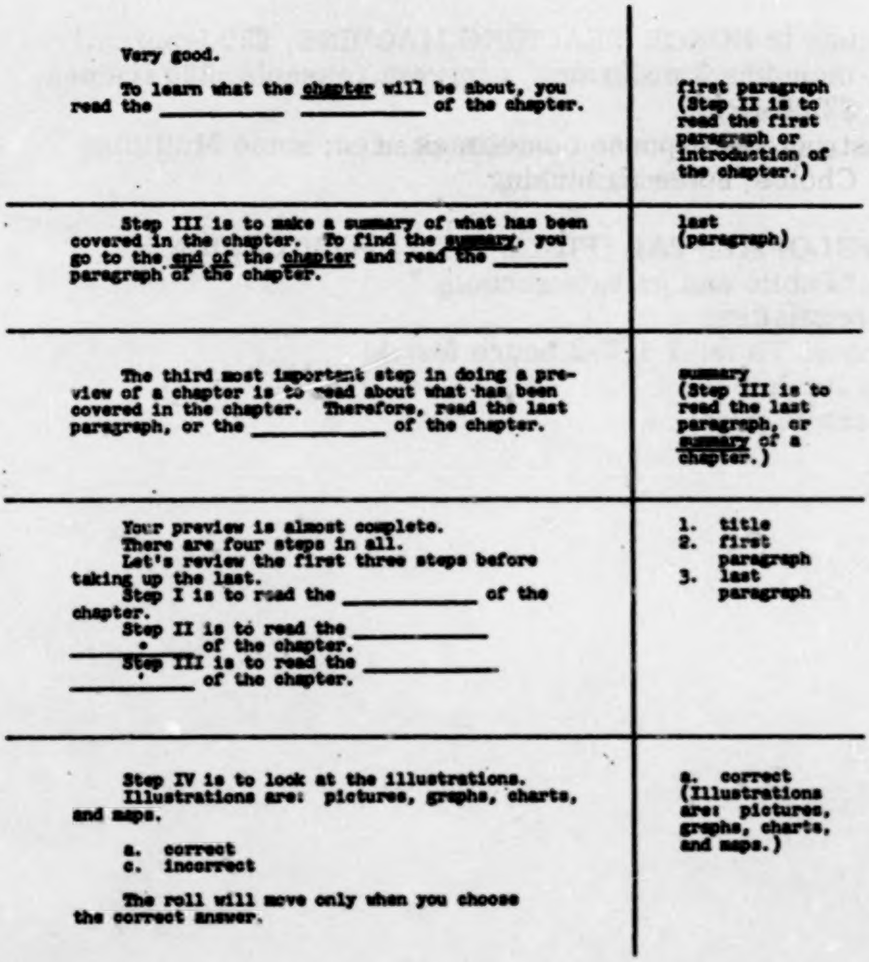
259 To develop efficient study habits, it is important to make a study-time budget or schedule. Making a study-time budget or schedule enables you to develop more _________ study habits.	efficient
260 Concentration is intensified through the development of a study-time budget. A study-time budget, therefore, develops the habit of _________.	concentration
261 As your ability to concentrate improves, you are less likely to be disturbed by outside _________.	noises
262 There is a great deal of satisfaction and pride from a job well done. Doing a good job allows you to enjoy the feeling of _________ and satisfaction.	pride
263 In this world of ours, you have to be able to plan your time wisely. Having a study-time budget trains you to plan your _________ wisely.	time
264 The first step in preparing a study-time budget is to make an activity record for a week. Making an activity record for the week is the _________ step in preparing a study-time budget.	first

STUDY SKILLS
Guide to Efficient Study
PAUL JOHNSON, Programer
RENATE LEPEHNE, Programer
Published by HONOR PRODUCTS COMPANY,
20 Moulton Street, Cambridge, Mass.

For use in HONOR TEACHING MACHINE, $20 (approx.) including 3 programs; program reusable, 200 frames, $2.00-$2.50.
Constructed Response sometimes used; some Multiple Choice; some Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"Public and private schools."
Prerequisites:
Average Time: 1 1/2-2 hours (est.).
Next Revision:
(1 sample page)

STUDY SKILLS
Johnson, Lepehne; HONOR PRODUCTS COMPANY
one sample page:



Very good. To learn what the chapter will be about, you read the __________ __________ of the chapter.	first paragraph (Step II is to read the first paragraph or introduction of the chapter.)
Step III is to make a summary of what has been covered in the chapter. To find the summary, you go to the end of the chapter and read the ______ paragraph of the chapter.	last (paragraph)
The third most important step in doing a preview of a chapter is to read about what has been covered in the chapter. Therefore, read the last paragraph, or the __________ of the chapter.	summary (Step III is to read the last paragraph, or summary of a chapter.)
Your preview is almost complete. There are four steps in all. Let's review the first three steps before taking up the last. Step I is to read the __________ of the chapter. Step II is to read the __________ __________ of the chapter. Step III is to read the __________ __________ of the chapter.	1. title 2. first paragraph 3. last paragraph
Step IV is to look at the illustrations. Illustrations are: pictures, graphs, charts, and maps. a. correct c. incorrect The roll will move only when you choose the correct answer.	a. correct (Illustrations are: pictures, graphs, charts, and maps.)

STUDY SKILLS FOR HOME USE
TECHNICAL STAFF, General Education, Inc.
Published by GENERAL EDUCATION, Inc.,
96 Mt. Auburn Street, Cambridge 38, Mass.

For use in TUTOR, program reusable, 2400 frames, $30.00 (machine and program).
Table of Contents.
Unit Test(s) available free. "Each unit is a final test for that section of the program."
Constructed Responses usually used, some Multiple Choice, no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
Developmental Pre and post tests used on 8-10 students per revision. Several revisions to achieve negligible error rates.
Prerequisites: Fifth grade reading level.
Average Time: 24 hours (est.).
Next Revision: "None planned as yet."
(3 sample pages)

STUDY SKILLS

STUDY SKILLS FOR HOME USE
Technical Staff, General Education; GENERAL EDUCATION
3 sample pages:

Excerpt from

Section 2: LEARNING METHODS I and II

Exhibit 2

The Lion by Ogden Nash

Oh,	weep	for	Mr.	and	Mrs.	Bryan!
He	was	eaten	by	a	lion;	
Following	which,	the	lion's	lioness		
Up	and	swallowed	Bryan's	Bryaness.		

38. Take three of your paper blocks and use them to hide three words in Exhibit 2 that you think you can remember.	(Three words in Exhibit 2 should now be hidden by paper blocks.)
39. Now read the entire verse aloud, recalling the three hidden words when you come to them.	(If you did not remember the hidden words, you may peek under the paper blocks.)
40. Now hide three more words that you think you can remember. Read the poem aloud once again, recalling all six hidden words as you come to them.	(Whenever you forget one of the hidden words, you may peek under the paper blocks.)

Excerpt from

Section 8: HOW TO STUDY FOR AN EXAMINATION I

Exhibit 1

Ia:	No	Lion	Can	Push	Down	Seven	Baboons
	E	O	H	H	E	A	O
	W	S	I	I	T	N	S
			C	L	R		T
	Y	A	A	A	O	F	O
	O	N	G	D	I	R	N
	R	G	O	E	T	A	
	K	E		L		N	
		L		P		C	
		E		H		I	
		S		I		S	
				A		C	
						O	

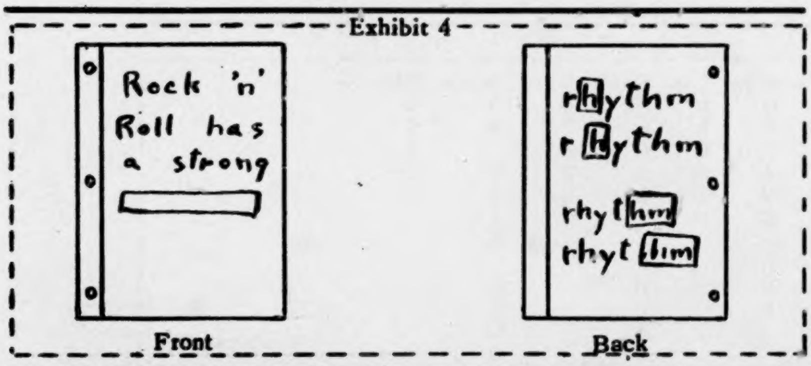
Ib:			
Dust	Dust	D	
Rubbing	Rubbing	R	
Acid	Heat	H	Dr. H. Map
Perspiration	Moisture	M	
Heat	Acid	A	
Moisture	Perspiration	P	

21. Already you know several good ways to remember lists. In Exhibit 1a, the method is to make up a sentence. The__________(which one?) letter of each word in the sentence is the same as the first__________of one word in the list.	**first; letter**
22. In Exhibit 1b, you made up a__________ using only the__________(which one?) letter of each of the words in the list.	**name; first**

Excerpt from

Section 20: HOW TO STUDY SPELLING I

Exhibit 4


Rock 'n' Roll has a strong
rhythm
rHythm
rhythm
rhytim
Front
Back

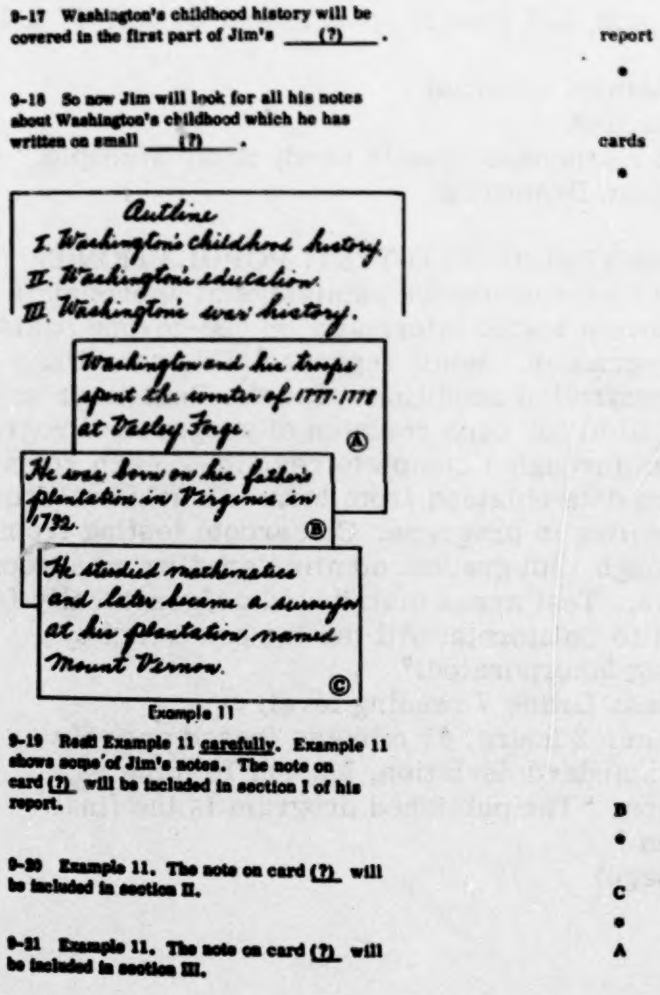
13. Exhibit 3 reviews the steps in studying a word. Study the spelling of "rhythm" on a piece of paper the way Exhibit 3 tells you to. Take your time.	Compare your work to Exhibit 4
14. Often you will have to learn many spelling words from a list. Studying one word on the list at a time is easy. However, it is better to study several of the words at a time.	No Answer
15. Although you can learn a single word very quickly, you may also forget it very quickly. It is better to study . . . (one/a few) word(s) at a time.	a few

YOUR STUDY SKILLS
JANE BOYD LARIMORE, Programer, Learning Inc.
Published by CORONET INSTRUCTIONAL FILMS,
65 E. So. Water Street, Chicago 1, Illinois.

Programed text, 285 frames, paperback, 57 pp., 7'' x 10", $1.20.
Teacher's Manual included.
Test Set included.
Constructed Responses usually used; some Multiple Choice; no Branching.

DEVELOPMENTAL (FIELD TEST) POPULATION(S):
"...Small representative samplings at appropriate grade levels tested informally on one-to-one basis with programer. Small representative samplings under controlled conditions (Dukane Redi-tutor using 35mm. film) for each revision of program. Program has been through 3 complete revisions, each revision based on data obtained from formal machine testing. Field testing in progress: Classroom testing from 6th through 12th grades, administered by classroom teachers. Test areas distributed geographically from Florida to California. All testing conducted by Learning Incorporated."
Prerequisites: Grade 7 reading level.
Average Time: 2 hours, 41 minutes (based entirely on data); standard deviation, 1 hour, 16 minutes.
Next Revision: "The published program is the final revision."
(1 sample page)

YOUR STUDY SKILLS
Larimore; CORONET INSTRUCTIONAL FILMS
one sample page:



9-17 Washington's childhood history will be covered in the first part of Jim's ___(?)___. report

•

9-18 So now Jim will look for all his notes about Washington's childhood which he has written on small ___(?)___. cards

•

Outline
I. Washington's childhood history
II. Washington's education
III. Washington's war history.

Washington and his troops spent the winter of 1777-1778 at Valley Forge Ⓐ

He was born on his father's plantation in Virginia in 1732. Ⓑ

He studied mathematics and later became a surveyor at his plantation named Mount Vernon. Ⓒ

Example 11

9-19 Read Example 11 carefully. Example 11 shows some of Jim's notes. The note on card (?) will be included in section I of his report. B

•

9-20 Example 11. The note on card (?) will be included in section II. C

•

9-21 Example 11. The note on card (?) will be included in section III. A

SK 9 80

APPENDIX A

Covering letter sent to publishers and known suppliers.*

CPI

The Center for Programed Instruction, Inc.
a non-profit, educational organization
365 West End Avenue at 77th Street
New York 24, New York

Apartment 11A
TRafalgar 3-7684

December 24, 1962

Dear Colleague:

As you know, *Programs, '62: A Guide to Programed Instructional Materials* has been the primary source of information as to the availability of programed materials. In order to keep up with the exciting developments in this field, we are now preparing *Programs, '63*. Again, we request your cooperation in this important endeavor.

Please complete one form for each program which can be ordered for delivery by September, 1963. Additional forms will be sent on request.

The form we are using differs somewhat from that used last year. Hopefully, it reflects developments in this rapidly changing field.

Since titles, per se, give such a poor idea of program content, we are including a "sample" of each program to enable prospective users to see for themselves the content and methods of approach, as well as the programing techniques. Since you or your authors can best select such a representative sample, we have made provision to reproduce, directly from the copy you submit, sample frames of each program.

For "scrambled" programs, we will print a maximum of one (1) page of sample frames for every five hundred (500) frames in the program. For other styles of program, we will print a maximum of one (1) sample page for every one thousand (1000) frames. Regardless of length, we will print at least one (1) page of sample frames per program. No more than ten (10) pages of sample frames will be printed for any one program.

Please prepare pages of sample frames as camera ready copy, 4½" x 6½". Do not leave external margins. We will reproduce your copy as sent in this exact size in a 5½" x 8½" book. We will include page numbers and headings in the additional space. We will not be able to reduce or enlarge copy prepared in other than the requested size. The book will be printed in black and white, therefore do not include color in your copy. (If your sample pages from last year are satisfactory to you, we can arrange to re-run them. However, we will need a new form completed for the program.)

Please include a letter giving the Center permission to reproduce these sample frames for this guide.

We must reserve the right to edit copy of the forms. Also, the final decision as to what constitutes programed material must reside with us. The word "program" has been in education for many years; our limits are not designed to be narrow, only helpful to our readers. Further, we will print data for programs only if *both* forms *and* sample frames are submitted to us. If sample frames are not received in time, publisher and program title will be listed only in the Publisher Index as was done in *Programs, 62*.

Since the guide is to be used in making plans for the academic year 63-64, we must request the return of both questionnaire and sample frames as soon as practically possible. We cannot guarantee publication of data received in our office after 8 February, 1963; if you can supply either questionnaire or sample frames before this date, it would facilitate our preparation of the guide for press. Please address all returns care of Dr. L. F. Hanson.

Sincerely yours,

Lincoln F. Hanson

Lincoln F. Hanson
Coordinator

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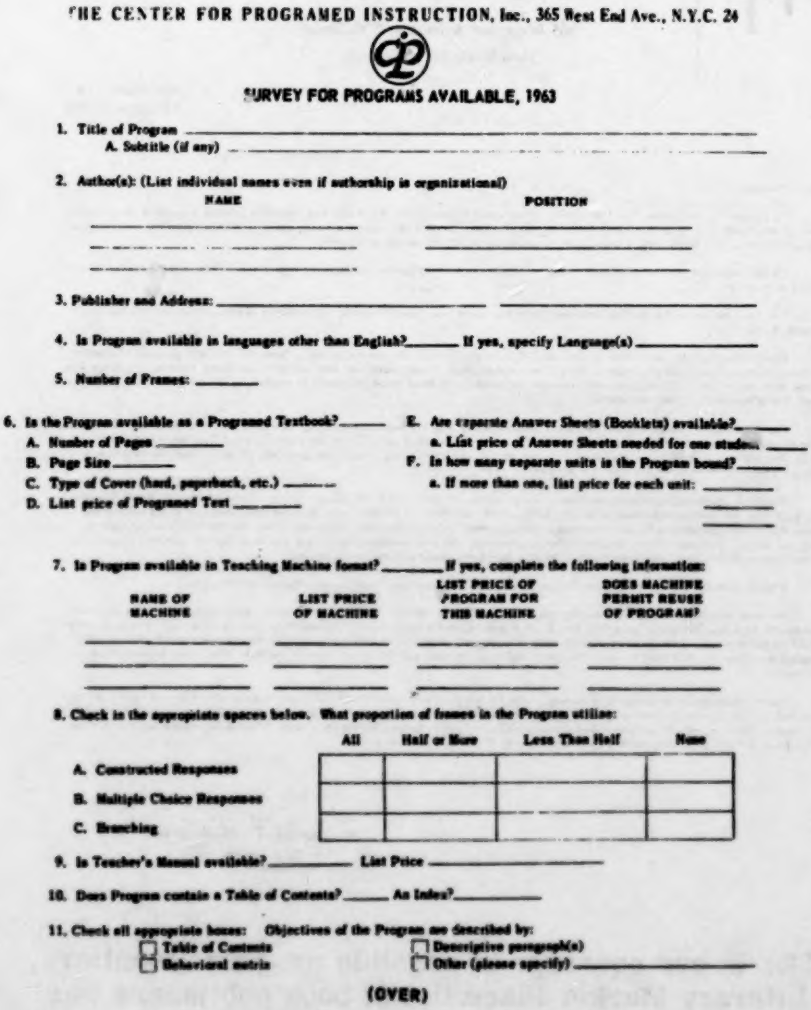
* NOTE: In our coverage of possible program suppliers, the Literary Market Place list of book publishers was circulated along with several lists of teaching machine manufacturers and the Center's general correspondence files. If we have inadvertently neglected any publisher, our apologies.

APPENDIX A

Publisher's Questionnaire.



THE CENTER FOR PROGRAMED INSTRUCTION, Inc., 365 West End Ave., N.Y.C. 24

SURVEY FOR PROGRAMS AVAILABLE, 1963

1. Title of Program ____________________
   A. Subtitle (if any) ____________________

2. Author(s): (List individual names even if authorship is organizational)

NAME	POSITION

3. Publisher and Address: ____________________ ____________________

4. Is Program available in languages other than English? ______ If yes, specify Language(s) ____________

5. Number of Frames: ________

6. Is the Program available as a Programed Textbook? ______
   A. Number of Pages ________
   B. Page Size ________
   C. Type of Cover (hard, paperback, etc.) ______
   D. List price of Programed Text ________
   E. Are separate Answer Sheets (Booklets) available? ______
      a. List price of Answer Sheets needed for one student ______
   F. In how many separate units is the Program bound? ______
      a. If more than one, list price for each unit: ________ ________ ________

7. Is Program available in Teaching Machine format? ________ If yes, complete the following information:

NAME OF MACHINE	LIST PRICE OF MACHINE	LIST PRICE OF PROGRAM FOR THIS MACHINE	DOES MACHINE PERMIT REUSE OF PROGRAM?

8. Check in the appropriate spaces below. What proportion of frames in the Program utilize:

	All	Half or More	Less Than Half	None
A. Constructed Responses				
B. Multiple Choice Responses				
C. Branching				

9. Is Teacher's Manual available? __________ List Price ____________________

10. Does Program contain a Table of Contents? ______ An Index? __________

11. Check all appropriate boxes: Objectives of the Program are described by:
   ☐ Table of Contents
   ☐ Behavioral matrix
   ☐ Descriptive paragraph(s)
   ☐ Other (please specify) ____________________

(OVER)

APPENDIX A

12. Test Availability:

		Number of items which are:							
	Check If Available	Free Response	Multiple Choice	True False	Matching	List Price Per Copy	Is More Than One Equivalent Form of Test Available?	If More Than One Equivalent Form List Test Intercorrelation(s)	Are Norms Available?
Unit Test(s)									
Final Test									
Diagnostic Test(s)									

13. A. Describe intended student population(s):

B. Describe other population(s) which have used Program:

C. Describe your developmental and/or field test population(s):

14. List any special student prerequisites:

15. Do you provide, or has there been published in the professional literature, any data relevant to the efficacy of the Program? Yes ☐ No ☐

16. Estimated date of publication of next revision ____________________

17. Additional equipment or materials required for this Program (e.g., slide rule, dictionary) [If you supply, please give list price per unit]

18. A. Estimated average time required to complete the entire Program (in hours)__________

B.. Above estimate is based on data: (check one) entirely ☐ partly ☐ just a guess ☐

C. If "entirely," give standard deviation.____________

19. Respondent information:
Name ____________________________
Position____________________________
Mailing Address________________________
Telephone______________ Ext. ________

20. Person to contact if above individual not available.
Name ____________________________
Position ____________________________
Mailing Address ________________________
Telephone ______________ Ext. ________

List any additional information you wish, however, we cannot guarantee its publication. Have you prepared and enclosed the sample frames as described in the covering letter?

APPENDIX B

Reprinted from Audiovisual Instruction, February, 1963

1962 Interim Report of the Joint Committee on Programed Instruction and Teaching Machines

American Educational
Research Association

American Psychological
Association

Department of
Audiovisual Instruction, NEA

With the cooperation and support of
the Educational Media Branch,
U. S. Office of Education
under NDEA, Title VII

THE members of the AERA-APA-DAVI Joint committee include Harry F. Silberman, Evan R. Keislar, Robert Glaser, and Arthur A. Lumsdaine, Chairman (American Educational Research Association); Richard S. Crutchfield, James G. Holland, and Lawrence M. Stolurow (American Psychological Association); and Jack V. Edling, Edward B. Fry, Wesley C. Meierhenry, and Paul R. Wendt (Department of Audiovisual Instruction, National Educational Association). Helpful contributions were made to the preparation and review of the present statement by a cooperating committee of the American Society of Training Directors, whose members are Leonard C. Silvern (chairman), Robert L. Craig, Stanley L. Levine, Leonard Nadler, and Gerald H. Whitlock. Also contributing were several consultants and staff assistants, including Lloyd O. Brooks, Martin V. Covington, H. J. A. Goodman, Bert Y. Kersh, Susan M. Markle, Ernest Z. Rothkopf, and David G. Ryans. Further suggestions from program writers, publishers, or users are invited for the committee's use in the preparation of subsequent reports. This present article, as an interim report, can be interpreted as expressing a consensus of Joint Committee members rather than an official policy statement of AERA, APA, and DAVI.

APPENDIX B

This statement by the AERA-APA-DAVI Joint Committee on Programed Instruction and Teaching Machines is concerned with educational techniques that are variously called "programed instruction," "auto-instructional" methods, and "programed learning."

The present statement amplifies and extends the previous guidelines published in 1961 by the Joint Committee.[1] This report, like the previous one, is addressed primarily to the non-technical reader interested in the possible purchase of programs. It summarizes some basic aspects of the nature and current status of programed instruction, and also presents some suggestions and cautions concerning the assessment of programs.

A subsequent, more technical report will provide supplementary information and recommendations addressed to the technical specialist who is directly concerned with obtaining or interpreting quantitative data to indicate the effectiveness of programs in contributing to specified instructional goals.

Programed instruction. As used herein, programed instruction refers to the use of materials or procedures which incorporate an "auto-instructional" (or self-instructional) program. Such a program commonly attempts to provide conditions under which a student can learn something efficiently with little or no outside help. Current programs typically employ a pre-arranged sequence of material that is presented to the student one small unit at a time (e.g., a sentence or paragraph). Most programs require the student to respond actively at least once for each unit (or "frame") of material–for example, by composing or selecting an answer to a question. Programs also commonly provide prompt confirmation or correction, as the case may be, for each response the student makes. In some cases, the program is presented by a mechanism or device called a "teaching machine"; in other cases it is presented by a specially designed form of book.

Some Basic Considerations Concerning Programed Instruction

With or without the use of "teaching machines" for controlled presentation of programs, individual instruction by programed materials offers a very important potential resource for education. Attention to the following guidelines is suggested, however, in order that the potentialities of programed instruction may be effectively developed and utilized.

Experimentation and planning for school use. Programed instruction represents a relatively new and thus far largely experimental resource for education. Experimental tryouts in schools, of both locally and commercially developed programs, is strongly encouraged. Widescale adoption of any particular program may well await the evaluation of one or more provisional tryouts of that program.

Curriculum planning. An important potential advantage of individual programed instruction is that abler learners can proceed at an accelerated rate through basic course material and thereby qualify sooner for advanced instruction. On the other hand, suitable programing may enable the slow learner to attain higher levels of proficiency than would otherwise be possible. Planning for adaptation of curricula to accommodate these possibilities needs to be undertaken as programed materials of demonstrated quality become available.

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[1] This earlier statement by the Joint Committee was published, among other places, as Appendix B in *Program '62*.

APPENDIX B

Perfecting programs through tryout and revision. Programed instruction affords outstanding opportunities for perfecting instructional sequences through successive revision based on detailed records of student response to preliminary forms of a program. The development of high-quality programs will generally entail considerable effort and expense. However, if costs can be prorated over a large number of students, a greater research and development effort can be invested in a program than might otherwise be considered feasible.

Tests of program effectiveness. Although the content which a program is designed to teach may be inferred from careful inspection of the program itself, external evidence based on student performance is needed to demonstrate how well the program actually teaches. However, the value of a method of instruction can not be tested in the abstract. For example, evaluation of a particular textbook is not an assessment of the usefulness of textbooks in general. A properly constructed experimental tryout or field test of a program may provide an assessment of that particular program, but does not afford proof or disproof of the value of a general "method" of programed instruction.

Experimentation conducted thus far supports the expectation that good programs, carefully developed, *can* significantly improve both the quality and economy of instruction. Whether any particular program *will* do so is subject to question until established by adequate tests of that program. Unfortunately, programs may be offered for sale that will fall short of the potential value of programed instruction—for example, because they have not been carefully developed through procedures that include sufficient tryout and revision to assure their effectiveness.

"TEACHING MACHINES"

Some programs require a machine for their presentation, while some are available only in book form. Other programs are available in two separate versions, one in book form and the other for use with a machine. In any case, it should be emphasized that so-called teaching machines, in themselves, do not teach. Rather, the teaching depends on the program of instructional materials that may be presented by a machine. The comparative merits of machine and nonmachine presentation of printed programs for use in schools is as yet an unresolved issue. Any advantage for machine over book presentation can not be tested in the abstract but would depend on the characteristics of a particular machine. Some machines have demonstrable advantages for certain uses, including research and suitable machines are required for programs that utilize audio materials.

Machine characteristics. The variety of types of teaching machines continues to proliferate, with little standardization. In evaluating any make or model of teaching machine, a continuing necessity is thus to assess the number and quality of programs available for use in it. For some machines the user who has sufficient time and skill can prepare his own programed materials; for other machines, this may not be feasible. With some machines a program can be re-used indefinitely; for others a new copy of the programed material may be required for each student.

APPENDIX B

For many machines, mechanical dependability can not yet be taken for granted. As with any new mechanical device, potential purchasers of teaching machines are well advised to seek reliable information on how extensively the device has been used in schools, what maintenance problems have been encountered, and the extent to which parts and service are locally available at reasonable cost.

Availability of machines. Existing machines differ greatly in complexity and cost; prices for most of them range from a few dollars to several hundred dollars per machine. Any catalog of teaching machines is likely to be obsolete as soon as it is printed because the field is developing so rapidly. New machines appear, and some advertised models fail to get into production. Several dozen different machines are briefly described and illustrated in a 1962 publication by Finn and Perrin.[2] A number of these are commercially available at present. Others have been withdrawn from the market or were experimental models that have never gotten into production.

PROGRAMS

Availability of Programs

An increasing number of programs is becoming commercially available in a variety of subject-matter areas. Mere availability is no guarantee of quality, however. In addition, programs (as well as machines) are sometimes announced long before they are actually available; also, as noted above, some programs are in a format that can be presented only with a particular kind of machine.

A useful guide to available programs for school subjects is a 383-page government publication entitled *Programs, '62.*[3] This publication lists some 120 programs reported to be commercially available by September 1962. These programs span the curriculum from elementary to college levels and cover a variety of subject matter, including language arts, mathematics, music, physical and biological sciences, social studies, and business education. The report cited includes descriptive information and one or more sample sequences from each program. Pertinent data given include the intended student population, the number of "frames" in each program, and its price, but no attempt is made to evaluate the programs.[4] It is anticipated that this compilation will be updated by similar guides for subsequent years.

Types of Programs

Programs are being produced in a variety of forms. Thus far they have tended to cluster around two or three main types; however, new variants or

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[2] Finn, J. D., and D. G. Perrin. *Teaching Machines and Programed Learning, 1962: A Survey of the Industry.* Occasional Paper No. 3, NEA Technological Development Project. Washington, D. C.: U. S. Government Printing Office, 1962 (Publication No. OE-34019; 85 p., 55 cents). See subsequent footnote concerning information presented in this report.

[3] The Center for Programed Instruction, Inc. *Programs, '62: A Guide to Programed Instructional Materials.* Washington, D. C.: U. S. Government Printing Office, 1962 (U. S. Office of Education, Publication No. OE-34015; 383 p., $1.50). See following footnote concerning information presented in this report.

[4] The reports on devices and programs identified in the two preceding footnotes are cited solely for the convenience of the reader, and statements concerning them are not to be construed as an endorsement by the Joint Committee or its parent organization, either as to completeness or accuracy of the information presented, or of the quality of the devices and programs listed in these publications.

APPENDIX B

mixtures of types are also being introduced. The majority of current programs break the subject matter down into a large number of small steps or "frames," requiring the student to make one or more responses to each step. Such a program can be so designed that the student will respond to critical aspects of each frame or will get practice in performing the specific operation that each frame is meant to teach. Careful programing requires the programer to take great pains to insure that these steps embody a logical, well-sequenced progression of the subject matter. This applies especially to programs that are intended to serve as sole or independent sources of instruction rather than only as supplements to other material. Such programs often provide a number of examples to illustrate each principle, concept, or act that is to be learned.

Programs of the kind described above are designed to adapt to individual differences by allowing each learner to proceed at his own rate. In addition, some types of programs further adapt by providing for "branching" to alternate materials. For this purpose, frames may include questions designed to diagnose the learner's needs, with directions taking him to alternate material suited to these needs.

In most of the current "branching" programs, the program is so constructed that the choice of a particular answer to a diagnostic question determines which frame will be presented next. Incorrect answers may take the student to frames containing information designed to correct the error before allowing him to continue through the sequence, or to frames that provide supplemental information or practice.

There is little empirical basis at present to favor one general type of program over another. It may be anticipated that different types of programs will eventually prove to be especially useful for particular kinds of educational purposes, and that different styles of programing may be combined effectively in a single program. At the present time, however, the general pattern of one type or another of programing may be superficially followed without necessarily capitalizing fully on its potential advantages.

CRITERIA FOR ASSESSING PROGRAMS

"Internal" and "External" Sources Of Information About Programs

A useful distinction can be made between "internal" and "external" characteristics which might serve as possible criteria for program evaluation.

"Internal" characteristics refer to features that can be revealed through visual inspection of the program. These include both the content of the program and the way the program is constructed. Content might be described in terms of relative emphasis given to various topics as well as general organization of the material. Descriptive characteristics of program construction might include information about the length of frames, use of branching sequences, techniques of prompting, patterns of repetition and review, modes and frequency of response called for, procedures and scheduling of reinforcement, and the like.

"External" information about a program refers to features which cannot be observed merely by inspecing the program itself, such as the way it was de-

APPENDIX B

veloped and characteristics of its performance as a teaching instrument. External information of interest to a potential purchaser could include such things as the source of program content, qualifications of authors, history of the program's development, tryout and revisions, and test data indicating gains in achievement produced by the use of the program. This information, as indicated more fully below, may be presented in a descriptive manual supplied by the program publisher.

Critical reviews of programs may furnish an additional basis for evaluation. Such reviews are beginning to appear in professional journals along with reviews of textbooks (Some reviews include data on achievement attained by using the program as well as the reviewer's opinion about program content and style.)

Programs as Related to Textbooks and to Tests

The applicability of internal and external kinds of information as possible criteria for evaluating programs may in part be seen by comparing programs with textbooks and also with educational or psychological tests.

Programs as compared with textbooks. Both programs and textbooks may be inspected to determine what topics are covered and the relative amount of attention given to each. Such inspection would also indicate whether the subject matter is factually correct, whether it is current, etc. However, despite their similarities, programs differ from textbooks in several important respects that may affect their evaluation. A program's requirement for frequent student response generates a special source of data useful for revising the program in detail. The tendency to empirically guided development of programs is coupled with an orientation toward testing the specific effects produced by a program, and toward more sharply focused objectives defined in terms of specified behavioral outcomes. In addition, the program is intended to generate a more predictable pattern of student behavior than does the study of a textbook, which generally has a less specialized purpose in aiming to serve as a reference source as well as a sequence of instruction.

Programs compared with psychological and educational tests. Although programs aim primarily to instruct students rather than to test them, programs and tests share some important attributes. Since both generate student-response data as an inherent feature, both tend to be developed in terms of empirical procedures. The difficulty of each item in a program, as in a test, can be investigated by presenting the program to appropriate samples of students and recording their responses. Both the program and the test have limited ranges of usefulness that can be described to the potential user in terms of empirical evidence; and in both cases it is possible to specify an external criterion to indicate the extent to which some intended outcome is achieved, as evidenced by the kinds of behavior that have been developed or differentiated.

Uses of Internal and External Information For Assessing Programs

Inspecting the subject-matter content of programs. At the present time, the principal recommended use of internal data obtained from inspection of the programed materials is for determining

APPENDIX B

whether program *content* is appropriate to the educator's objectives. As with other educational materials, program titles often are not definitive. Programs labeled with the name of a particular subject matter can vary widely in terms of content and associated instructional objectives. The prospective purchaser of a program should, therefore, inspect the content of the program at least as carefully as he would that of a textbook. Preferably he should go through the entire program to determine what aspects of the subject are treated or omitted, and the extent to which particular sub-topics are developed.

Limitations of program inspection. A risk in relying on inspection for evaluating a program is that one's perception of its value may be inappropriately influenced by his reaction to particular structural features of the program. For example, certain frames or items may seem too difficult or too easy. However, the difficulty and appropriateness of items in a program, like those in a test, generally cannot be judged accurately by inspection alone. External data are needed – data from an actual tryout of the program on students who are representative of the population of intended users.

The need for test data to assess a program's effectiveness. Empirical evidence on what is learned from the program can also be a better basis than mere inspection for answering such questions as whether program sequences have too much or too little repetition, review, prompting, overlap of steps, etc. At present, the scientific evidence is not considered sufficient to permit accurate prediction in these respects or to justify recommendation that adherence to specific rules of program construction be used as a basis for program evaluation. External evidence is recommended as the main basis for the evaluation of program effectiveness–in particular, test data obtained from using a program under specified conditions which provide dependable measures of gains produced in student achievement and of the time students require to achieve these gains.[*]

Uses and assessment of programs. Programs may have a variety of uses. For example, they may be intended to provide the main source from which students are expected to learn facts, principles or skills–or they may be intended only to review or introduce other instruction. In most schools, programs will probably be used in conjunction with other media of instruction. However, no matter what eventual use is contemplated for a program, it will generally help a prospective user to know what the program *itself* actually contributes to the student's knowledge or proficiency–in addition to what is contributed by other elements in the instructional situation.

The kinds of effects that can be revealed through empirical tryout are limited by the content of the achievement tests or other measures used to assess these effects. Inspection of the program by the prospective purchaser, supplemented by independent professional reviews (when available) may sometimes suggest additional uses for which a program might be suitable, or kinds of program effects which are not indicated by field-test data because they were not contemplated in the programer's original purpose.

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[*] This emphasis on external criteria for assessing program effectiveness is consistent with the position earlier advocated in Lumsdaine and Glaser's 1960 "Concluding Remarks" (*Teaching Machines and Programmed Learning*. NEA-DAVI, Washington, p. 256), and in Rothkopf's 1961 conference report, "Criteria for the Acceptance of Self Instructional Programs" in *Improving the Efficiency and Quality of Learning*. A. E. Traxler, editor. Washington, D. C.: American Council on Education, 1962, p. 30-38.

Inspection of achievement-test content. Aside from the data obtained in testing a program's use under laboratory or field conditions, inspection of the program itself as a basis for appraisal can be supplemented if the author or publisher has spelled out the program's purpose by describing and exhibiting in full the achievement-test items which purport to exemplify what the program is intended to teach. These criterion-test items, as well as responses called for by the program and test, can be examined to see what the learner is required to be able to do, and whether this reflects the kind of competence which the educator wishes to achieve. Such an analysis of test content as a basis for determining a program's objectives may be particularly helpful for programs which are intended to serve as a primary source of instruction rather than merely as an adjunct to other instructional material.

REPORTING DESCRIPTIVE INFORMATION ABOUT PROGRAMS

Manuals for Providing External Data

"Manuals" for tests and programs. Because some of the characteristics needed to appraise educational and psychological tests are revealed only through data obtained by using them, it has become accepted practice to furnish information about test characteristics in a manual supplied by the test producer. It appears both desirable and feasible to provide a similar manual for programs as a vehicle for presenting relevant external information about properties which are not apparent on inspection.

Questions that might be answered about a program. Information presented in a manual can help program producers or distributors to answer questions which the prospective purchaser may wish to ask as a basis for selection. Several areas of such questions concerning external information about a program may be identified. These questions might deal with (1) the program's purpose and intended use, (2) the source of program content, (3) the way the program was developed, including tryout and revision, and (4) the conduct and results of testing to determine empirically the effectiveness, or "performance characteristics," of the published program. The last of these kinds of information will generally be considered the most important; however, it also involves the kind of data which may be hardest to evaluate as to adequacy without specialized technical advice.

Purpose and Scope of a Program Manual

The kind of manual here suggested could apply to all types of programed materials. However, some of the details appropriate for some programs probably would not apply to others. For example, less test data would probably be needed in the case of very short programs.

It is expected that the main user of such a manual would be the school district or other large-scale purchaser interested in buying programs in considerable quantity. To evaluate fully some of the data that could appropriately be included would generally require advice from a technical consultant who has professional training and competence in testing and measurement techniques as well as in statistics and experimental design. However, the manual also could well supply general interpretive information to help the non-technical purchaser determine the program's relevance to his educational purposes. Such information could precede and refer to, when appropriate, the presentation of the technical detail needed for the specialist to appraise a program's effectiveness.

Program "labels." In addition, a digest of the information in the manual might be presented as a brief preface or "label" attached to individual copies of the program. Such a label could, at a minimum, indicate the purpose and intended use of the program, who was primarily responsible for its content and preparation, and the source of publications in which further data on its development and effectiveness might be found. This information should include the age- or grade-level (s) of the learners for whom the program is designed, and the prerequisite skills and abilities these learners are assumed to have. The publisher could then characterize and briefly illustrate the kind of competences the program has been demonstrated to produce when used in the manner suggested.

Further Information on Source and Development of Program Content

A more detailed manual which could be supplied by the program publisher to prospective users on request might elaborate this minimum information in relation to further questions, such as the following, which concern the source and development of program content.

Sources of content. What textual or curriculum sources were used in the selection and development of the content? How current were these sources? Who were the programer (s) and the collaborating curriculum specialists or subject-matter consultants (if any), that prepared, edited and reviewed the program materials? What are their academic and experience qualifications with respect to competence in the subject matter and techniques of programing? To what kind of review was the program material subjected during its development?

Development, tryout, and revision. As previously noted, records of learners' responses to preliminary versions of a program can provide a basis for its progressive revision and improvement prior to publication. Accordingly, the prospective purchaser might wish information about the extent to which such tryout and revision has been conducted, the kind and amount of student-response data obtained, and the way in which the data were used in revising the program. The manual might also indicate the criteria used to determine when the program was ready for final release and printing prior to the effectiveness testing on which the performance characteristics of the published program are based. As supplementary information, the producer might also wish to indicate the assumptions made and principles used in constructing the program.

Information About the Demonstrated Effectiveness of a Program

It is to be hoped that the manual for a program, at least for major programs of considerable scope, will furnish evidence on the program's effectiveness based on measurement of student performance on pre- and post-program criterion tests.

APPENDIX B

These tests should be exhibited either in the manual or in an available supplement, so as to exemplify what the producers expect the student to learn as a result of program use.

Program producers are strongly encouraged to support any claims for the effectiveness of the program in terms of gains in student performance produced by the final, published version of the program, as revealed by appropriate criterion tests. A clear distinction should be made between this effectiveness-test data for the final program and any test data obtained in earlier tryouts of preliminary versions used as a basis for revision. (Changes made in the program after the later effectiveness-test data are obtained could throw doubt on the validity of these data for a demonstration of the program's effectiveness.)

The manual should present whatever further information would seem helpful in evaluating the reported effects of the program or the adequacy of the evidence on which they are based. It should in all cases present evidence to document for the technical reader that the gains in achievement reported can rightly be attributed to the effect of the program's use rather than to extraneous causes. In addition, it should describe the physical and social conditions of the program's use and effectiveness-testing procedures in sufficient detail so that their essential features could be reproduced by another investigator if desired. This information would include details of supervision and incentives used, other instruction given, size of student groups, and physical arrangement of rooms during program use and testing. Any material discrepancies between recommended conditions of use and those that were employed in obtaining the effectiveness-test data should be noted. Students' prior experience with programs and teaching machines, if any, should be noted in view of spuriously large temporary gains that can sometimes result as a novelty effect when a new device or procedure is first introduced.

The manual should indicate how many of the students started and completed the program, the average length of time they required to finish it, the average level of performance on the specified pre- and post-program tests of achievement, and the range or variability with respect to these measures. Relevant further temporal data would include the amount of time learners of different ability spent on various portions of the program, how this time was distributed (especially for long programs), and the time lapse between the completion of the program and the criterion test.

Effectiveness tests could of course be conducted so as to include post-program measures other than the test that specifies the programer's objectives. The program's effect on secondary objectives not originally aimed at could thus also be revealed. However, whether or not such tests are conducted by the producer or by others (e.g., by a prospective user or by an independent research agency), it is to the programer's interest to specify what he intended as the program's principal objectives. Finding a program to be ineffective or of only limited effectiveness for contributing to a secondary or unintended objective might be helpful to the user in making a decision about the use of the program for that purpose, but cannot properly be held as a criticism of the programer's effort.

It is anticipated that a school district contemplating the use of a program will be interested in its effect on performances other than those tested by the program producer. Particularly in this case, it is recommended that, when possible, potential users assess a program by their own field tests, guided by suitable technical consultation,* before deciding on adoption of a program for wide-scale use. Performance characteristics of a program could specify its effectiveness in affecting behavior of students describable as changes in knowledge, understanding, skill or other outcomes, including beliefs, interests, and motivations.

Learner characteristics. Specification of prior knowledge and ability of learners can serve both to identify the pre-program base line from which gains may be measured, and also to indicate what prerequisites are needed in order to learn effectively from the program. Learner characteristics may be specified as an aspect of the program's purpose and intended use. The corresponding characteristics for the samples of students used in preliminary tryouts or, particularly, in the effectiveness-testing of the program, should be separately specified so as to indicate the degree to which these learners were typical or atypical of the learners for whom the program is intended. The producer should also indicate the limits (particularly the lower limits) of the population for whom the program is intended, and of the samples used in testing its effectiveness.

Technical information concerning the conduct of effectiveness-testing. Valid assessment of what is taught by the use of a program generally involves special technical problems. Evaluation should, whenever, possible, utilize the assistance of technical specialists having recognized competence in educational measurement and experimental design. The analogy of programs with standardized educational and psychological tests also suggests a precedent for preparation of technical recommendations by members of relevant professional organizations. These recommendations can serve both to help insure the technical soundness of effectiveness-testing procedures, and to promote comparability and interpretability of data by fostering consistently high standards of practice in reporting the results of tests. The further interim report to be published at a later date by this Committee will discuss in more detail some of the technical problems of assessing what the use of a program, in and of itself, contributes to definable instructional goals.

APPENDIX C

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Vol. 46, No. 278 December, 1962

Programmed Learning—20 Questions

John R. Belton

Dear Programmed Learning Materials Salesman:

OUR programmed learning committee will be pleased to meet with you next Thursday at 1:30 P.M. Because we have scheduled appointments with several sales representatives this same afternoon, it will be necessary for us to limit our discussion with you to thirty minutes. We are now familiar with the history of programmed learning and the basic educational and psychological theories underlying programmed instruction. We would appreciate it if you would answer the following questions as part of your presentation:

1. What is the scope and sequence of programs which you have available for distribution at present and what other programs are you preparing?

2. What is the intended student population and what prerequisite courses (if any) are required for each of your programs?

3. Approximately how much time is required by the *average* student in a given grade to complete each different program?

4. Where will we find information about the qualifications of the authors of each of your programs?

5. Are the general aims and specific objectives of each program indicated in the unit or course description?

6. What is the reading ability level required for each program and how has this been determined?

7. How and where was each program tested?

8. Where in our geographical region have your programs been used and where in this vicinity are they being used at present?

9. Are your programs available in both "machine" and "programmed text" formats?

10. What is the form of response required for each of your programs?

11. Are your programs designed to be used with separate answer sheets and are these supplied?

John R. Belton is a Psychometrist with the Joint School District No. 1, 9333 West Lincoln Avenue, West Allis 14, Wisconsin.

APPENDIX C

12. Is there a teacher's manual or guidebook for each program containing references, supplementary information, and suggestions for the use of other enrichment materials?
13. Do pre-tests, progress tests, and final tests accompany each program?
14. Are the tests provided diagnostic tests or achievement tests?
15. Are test-results norms tables available?
16. Which standardized tests may be used effectively with your programs?
17. Are your programs in mathematics and science based on "modern" mathematics and science concepts or are they traditional in nature?
18. Do you provide forms for recording student progress, achievement, and reactions?
19. What is the cost per frame and/or the cost per instructional hour for each of your programs?
20. And, finally, do you supply programs at discount prices for schools interested in pilot-study projects and research?

I am certain that, if you will answer these questions about the programmed learning materials you distribute, we will be in a better position to determine if we will be able to use them effectively in our school system.

AUTHOR INDEX

Abegg, Taylor 659 661, 671
Abraham, Willard 224
Alcock, Wayne T. 17, 25, 215, 661
Alexander, Howard W. 460
Allen, Layman E. 390, 392
Anderson, Nancy 325
Andrego, P. J. 226
Anwyll, Jean 250, 583, 702
Arky, Marshal & Associates 97, 367, 525
Astra Staff 8, 23, 43, 642, 655
Austwick, K. 353
Autor, Sanford M. 118, 466, 739
Ball, Dale 130
Banghart, Frank W. & Staff 431
Barcus, Delbert L. 290
Barnes, Barry 138
Batcheller, John 533
Beach, Anne 88, 136, 168, 176
Beagin, Joe 521
Becker, James L. 388, 539
Becker, W. G. 505
Belash, David R. 614, 618, 624, 677
Bernstein, M. 109
Bertholomey, Donald 6, 51, 278
Bierman, Emanuel 150, 198, 246
Binder, Jerome 76
Bitterlich, Shirley B. 74, 136, 191, 369
485, 659, 661, 671
Blumenthal, Joseph C. 152
Bobrow, Daniel C. 395, 409
Boucher, J. 262
Bowman, Barbara 683
Boyd, Audry V. 124
Branson, Robert K. 191
Brethower, Dale M. 545
Brown, Duane 665
Buchanan, Cynthia D. 218, 229

AUTHOR INDEX (continued)

Buckley, Paul H. 589, 412
Burmester, Mary A. 650
Burroughs, Eliane 264
Busch, M. C. 272
Bustoz, Joaquin 49, 452
Cabrinka, Peter M. 138
Carlson, Paul H. 126, 168, 191
Carman, Robert 693
Chaplin, Robert M. 88
Cheney, Carl 140
Churchill, Marjorie 93
Ciardi, John 209
Coffroth, James 248
Collignon, Joseph P. 162
Comstock, Frederic G. 88
Cook, Donald 444
Coover, R. H. 272
Coursey, R. Clayton 36, 57, 316, 379
Cram, David 537
Crowder, Norman A. 308, 359, 477
Cummings, Diana 355, 583
Cunningham, Art 493, 495, 499
Curtis, Edward B. 382
Dausch, Vernon L. 47, 333, 384, 399, 448
Davey, Ruth Ann 222
Davis, Jeanne K. 138
Davis, P. E. 487
Dawson, C. H. 663
Dawson, David J. 663, 695
de Baca, Polo C. 14, 53, 178, 226, 652
Devereux—six programs—all Devereux staff 1, 30, 59, 78, 233, 67
Devine, James V. 25, 63
Dickey, Franklin M. 205
Dinnerstein 719
Doran, Linda L. 25, 659
Dreibelbis, P. 706
Brooyan, I. 335
Druger, Stephen 663
DuBois, Betty Lou C. 63, 74, 138, 257, 533
Earl, B. 407, 462
Earl, Francis A. 591
Early, William L. 577, 581, 620, 638

AUTHOR INDEX (continued)

Education Engineering 111, 182, 565, 644, 736
Edwards, Richard 632
Eigen, Lewis D. 417, 549, 614, 618, 677, 624
Ellert, Ernest E. 270
Ellis, Henry C. 215, 357
Emerson, Ruth 417
Esbensen, Thorwald 32, 61, 160, 184, 186, 188, 237
Evans, James L. 19, 71, 126, 132, 295, 346, 454
Fawver, R. A. 176
Feibleman, Peter 695
Fels, Rendig 93
Ferguson, Leigh H. 739
Ferster, Charles B. 268
Ferster, Marilyn 361
Foltz, Charles I. 301
Fonseca, John R. 91, 501
Ford, Renee 667, 669
Frackenpohl, Helen 252
Fremont, Jean 266
Friel, Betty K. 28
Frye, Shirley 452
Fullilove, John T. 226, 652
Gardner, Neely D. 101
Garland, Henry 41, 323, 440
General Education Staff 103, 122, 171, 220, 244, 471, 535, 747
Gentry, Frank C. 25, 63
Gilbert, Thomas 325
Ginn and Company—Staff 708, 726
Ginsberg, Arlene 575
Glascock, Gayla 19, 683
Glaser, Robert 365
Goldstein, Leo S. 457
Goren, Charles H. 134
Gormley, J. V. 266
Gotkin, Lassar G. 457
Gowen, J. A. 80
Grillo, Elmer V. 99
Haines 405
Hardison, James M. 306
Haring, Darlene 146, 622, 741
Haring, Lloyd L. 622, 730
Harms, L. S. 215

AUTHOR INDEX (continued)

Harr, E. 706
Harrell, T. W. 80
Harris, Frank E. 371, 679
Hathaway, Barbara H. 527
Hatton, Ned 369
Hauck, William 10, 21
Heimer, Ralph T. 340
Hickey, Albert E. 118, 466, 739
Holzman, Albert G. 365
Homme, Lloyd E. 51, 178, 194, 285, 454 529
Hornung, William J. 497
Huff, Willie Y. 176, 191
Huffman, Harry 114
Hughes, Robert J. 569
Hunt, Amaryllis D. 17, 25, 357, 405
Hurst, Donald 32, 61, 160, 184, 186, 188, 237
Jeffries, Arthur P. 600, 603, 605, 607
Jenks, Charles 32, 61, 160, 184, 186, 188, 237
Jensen, Gerald L. 712
Johnson, Paul 745
Joline, N. 252
Kain, Helen 213
Kahji, Yasuko 283
Kalin, Robert 41, 440, 323
Kantor, Robert H. 557, 573, 559
Kaplan, Jerome D. 417
Keys, Charles M. 130
Kimble, Daniel P. 700
Klausmeier, Herbert J. 697
Kline, H. 706
Kocher, Frank 340
Koltanowski, George 140
Komoski, P. Kenneth 549
Krakow, Professor 34, 314
Krosnick, Dr. Arthur (Consultant) 483, 489
Krouse, Harold M. 417
Kush, Frank 142
Larimore, Jane B. 224, 505, 511, 587, 751
Lash, Elton R. 681
Lawson, Chester A. 650
Lawvere, F. William 331
Lazar, Nathan 329
Leader, Rabbi Max 278

AUTHOR INDEX (continued)

Leavenworth, James E. 205
Lefkowitz, Robert J. 663
Lehman, Warren 523, 734
Lepehne, Renate 240, 745
Levine, Stanley L. 491, 571
Levinsky, Sheila M. 142, 427, 585, 616, 665, 732
Lindberg, Howard 357
Lottes, John J. 340
Lowery, Patti 222
Luckham, David C. 475, 386, 481
Lucy, Jean 503, 509
Lynn, James E. 136
McCollough, Celeste 469
McDonald, Arthur S. 252
McFadden, M. 450
MacKenzie, David E. 118
MacRae, James 591
Mager, Robert F. 559, 561, 573
Markle, Susan M. 254, 549
Martin, Grace C. 308, 375, 477
Mavrinak, H. 706
Maxwell, Thomas 665
Meacham, Jac D. 130, 144, 266, 272, 281, 283
306, 521, 541
Meade, Frances U. 612
Mechner, Francis 695
Meo, Martin 34, 314
Michael, Madeleine L. 427
Milholland, John E. 464
Millman, Joseph 76
Milton, Ohmer 547
Monroe, M. H. 144
Montgomery, A. T. 80
Moore, J. W. 10, 21, 55, 373
407, 446, 450, 462
Moore, R. K. 357
Morgan, Edna M. 63, 205, 215, 517
Morris, John 327, 405, 632
Morris, Richard 86
Moskowitz, Martin, M. 47, 399, 333
384, 448, 473
Munch, Theodore W. 628

AUTHOR INDEX (continued)

Murphy, Daniel P. 310, 429
Neal, Winifred 162, 531, 730
Neilsen, Burl 427
Nichols, Eugene D. 41, 323, 440
O'Malley, Richard H. 397
Owens, J. B. 569
PakDonald Publishing Co. Staff 507
Panares, Rodrigo 591
Parry, Scott B. 95, 107
Paul, William 95
Pazel, Marcia B. 517
Pearsall, Lewis J. 17, 63
Perrini, Laurence 209
Person, Donna M. 628
Peterson, Allen 222
Pipe, Peter 567, 569
Pollack, Harvey 630
Potell, Herbert 235
Pratt, John C. 207
Prentis, Robert R. 509
Prouse, Peter 215
Ramirez, Louise 222
Ranucci, Ernest R. 47, 333, 384, 399, 448
Rifugiato, F. 706
Reger, Jacob 17, 74, 327, 671
Reid, James M. 209
Reid, Josephine 281
Reigh, M. 55, 373, 446
Rickert, Edward J. 63, 132
Rickert, Mary 257
Ripple, Richard E. 543, 697
Robinson, Edward J. 120
Roca, Marianna 704
Rosenberg, Ruth B. 3, 164
Ruddle, James F. 25, 517
Rudolph, Stephen A. 663
Saffold, Robert 377
Saltzman, I. J. 288
Sanborn, Paul 569
Sapon, Stanley M. 299
Saveland, Robert N. 626
Schaefer, Halmuth H. 268, 365, 600, 603, 605, 607

AUTHOR INDEX (continued)

Schramm, Wilbur 235
Schure, Alexander 34, 150, 198, 246, 314, 551, 630, 719
Scott, Theodore G. 363
Seltzer, Morton 47, 399, 333, 384, 448
Shier, David 32, 61, 160, 184, 186, 188, 237
Siegel, Bertram M. 614, 618, 624, 677
Sierra-Franco, M. 483, 489
Simmons, Nancy 509
Smalley, Ann 375, 377
Smith, M. Daniel 12
Smith G. L. 487
Smith, James A. 45, 69
Smith Kellogg 180, 211
Smith, Roland F. 460
Smith, Wendell 10, 21, 55, 373, 407, 446, 450, 462
Snyder, George M. 148, 155, 182, 200, 736
Soens, T. 706
Spache, George D. 235
Speroff, B. James 515
Spooner, George 414
Stack, Edward M. 260
Stapleford, Jane 211
Starleaf, Dennis 93
Steele, Leighton 180, 211
Steger, Arthur 74
Stocking, Barbara 695
Stranczek, Theodore S. 226
Studebaker, Gordon 65
Studebaker, John W. 65
Sullivan, M. W. 166, 293
Taylor, Stanford E. 252
Therrien, Mel 519
Thomas, Paul 401, 403
Thompson, Claude 442
Thornhill, Patrick 714
Titiev, Robert J. 312
Tosti, Donald T. 6, 14, 53, 71, 194, 274, 529, 555
Trujillo, Tom 485
Turkkan, Oguz R. 262
Universal Electronics Laboratories Corporation 38, 157, 202, 303, 318, 609, 716, 723, 743

AUTHOR INDEX (continued)

Utton, Mary 25, 215, 632
Valdes, Rafael 295
Van Atta, L. 469
van Ostrom, Marshall 728
Van Valkenburgh, Noogor & Neville 553, 563
Ventolo, William 82
Wagers, Chock 130
Warren, Alice 721
Wentworth, G. O. 80
West, Leonard J. 547
White, Jerome B. 74, 168
Whisler, Laurence 321, 479, 513, 634, 636, 689, 691, 710
Willford, Nancy G. 242
Williams, Charles 231
Wilson, Niram A. 274, 285
Wohl, Seth 614, 618, 624, 677
Woolman, Marcia 222
Woolman, Myron 222
Wooton, William 335
Wyckoff, L. Benjamin 226
Yesselman, Charlotte 343, 346, 401, 403
Yilmaz, H. 657
Young, Jay A. 673, 675, 687
Zaborska, Marta 174, 248, 579, 640, 648
Zahniser, Adrienne 180, 211
Zalenka, Frances J. 168
Zoll, Edward J. 47, 333, 384, 399, 448

PUBLISHER INDEX

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Lower Primary Arithmetic 59
Multiplication and Division 78
Remedial Reading 233
Upper Primary Arithmetic 67

DOUBLEDAY & CO., INC.

Adventures in Algebra 308
Arithmetic of Computers, The 359
Basic Computer Programming 363
Effective Executive Practices 101
Effective Writing 211
Elements of Bridge 134
Fractions 28
Introduction to Electronics 569
Meaning of Modern Poetry, The 207
Parliamentary Procedure 734
Practical Law 523
Practical Mathematics 375
Proper Punctuation 180
Slide Rule, The 377
Trigonometry 477
Your Life Insurance 527

EARLHAM COLLEGE

Elementary Statistics, Part I 460

EDUCATION ENGINEERING, INC.

Algebra 11	316
Applied Geometry 36	379
Arithmetic 22	36
Basic Electronics 07	565
Basic English 37	148
English Grammar 28	155
General Mathematics 40	57
Insurance Premium Financing	111
Muscles, Nerves, and Bones of the Head	644
Parliamentary Procedure 29	736
Punctuation & Capitalization 26	182
Reading, Graded Programs, 5th-12th Grade Vocabulary	-
Shorthand 33	124
Spelling Improvement 18	200

EDUCATIONAL DEVELOPMENTAL LABORATORIES

Word Clues	252

EDUCATIONAL METHODS, INC.

Bank Teller Training Course	86
Detecting Counterfeit Money	-
How We Prosper	728
Principles of Accounting	82
Programed Instruction and Programing Technique	545

ELECTRONIC TEACHING LABORATORIES

Everyday American English	-
French (Elementary) Series I	260
German, Series I	-
Learning the Dialogue Mass	519
Russian, Series I	-
Spanish (Elementary)	301

ENCYCLOPAEDIA BRITANNICA PRESS

Achieving Clarity Through Punctuation	176
Algebra I	310
Algebra II	312

ENCYCLOPAEDIA BRITANNICA PRESS (continued)

Analytic Trigonometry 475
Arithmetic of the Whole Numbers 45
Basic Mathematics 395
Beginning Bookkeeping 88
Chemical Bonding 659
Chemical Mathematics 661
Contract Bridge for Beginners 136
Elementary French 257
Foundations of Multiplication & Division 74
Fractions I and II 25
French Phonetics 264
Fundamentals of Poetry 205
Gas Laws 671
German A 270
Improving Your Spelling 191
Interior Decoration 517
Introduction to Algebra 327
Introduction to Sets, Inequalities, and Functions 442
Introduction to Verbal Problems in Algebra 329
Introductory Calculus 409
Introductory Descriptive Statistics 464
Introductory Spanish 293
Language of Algebra, The 331
Mathematical Bases for Management Decision Making 365
Measurement in the Metric System 369
Medical Physiology for the Home 485
Musical Notation 533
Plane Geometry 382
Principles of Debate 215
Problems in Percentage 17
Ratios & Proportions 63
Seventh Grade Mathematics 429
Solid Geometry 386
Space Science 632
Spanish A 299
Strengthening Grammatical Concepts 168
Technical Skills in Research Paper Preparation -
Trigonometry (Plane) 481
Whole Numbers and Numerals 69

ENTELEK INCORPORATED

Programmed Instruction in PERT and CPM 118

E-Z SORT SYSTEMS, LTD.

Beginning Sight Vocabulary 237
Beginning Spelling 188
English Usage 160
Number Facts 61
Understanding Fractions 32
Using Capital Letters 184
Using Punctuation 186

FEARON PUBLISHERS, INC.

Explaining "Teaching Machines" and Programming 537
Preparing Objectives for Programmed Instruction -
Safe Driving, Self Taught -

GENERAL DYNAMICS/CONVAIR

Value Control 130

GENERAL EDUCATION, INC.

Applications of Programed Instruction 535
Fundamentals of Finance and Investment 103
Salesman's Call Report, The 122
Statistics: Probability Models of Random Processes 471
StudenTutor Library of Matching Exercises 220
StudenTutor Library of Sentences, Words, References 171
StudenTutor Library of Vocabulary Enrichment 244
Study Skills for Home Use 747

GENERAL PROGRAMED TEACHING CORP.

How To Score Bowling 138
Vector Algebra 357

GINN AND COMPANY

Constitution, The 708
How a Bill Becomes a Law 726
Program on Earth-Sun Relations, A 626

GRAFICROLL SYSTEMS, INC.

Advanced Analyzing Multiplication	-
Advanced Slide Rule	-
American Heritage	-
Analyzing Addition	-
Analyzing Multiplication	-
Basic Operations & Understanding	-
Discovering Patterns in Arithmetic Sequence	-
Fractions	-
French TravaTutor	266
Geometry	-
German TravaTutor	272
Italian TravaTutor	281
Japanese TravaTutor	283
Linear Motion	-
Number Digression	-
Number Line, The	-
Numismatics	144
Official Girlwatcher's Manual	521
Phonetics I & II	-
Programed Instruction	541
Sets and Numbers	-
Spanish TravaTutor	306
Vectors	-

GRAFLEX, INC. 3750 Monroe Ave., Rochester 3, N.Y.

Addition of Fractions	-
Asexual Reproduction in Plants	-
Classification of Plants	-
Computing Square Roots	-
Earth's Surface, The	-
Introduction to Color Concepts	-
Introduction to Entomology	-
Introduction to Probabilities	-
Life Cycle of Insects	-
Mole Concept in Chemistry, The	-
Our Earth and the Universe	-
Time Telling	-
Trees, Their Uses and Structures	-
Use of Dictionary Guide Words	-
Using Clouds to Predict Weather	-

HAMILTON RESEARCH ASSOCIATES, INC.

Black and White Inspection 493
Black and White Printer Training Program 495
Business Law 91
Color Inspection 499
Color Printing -
Corporation Finance -
Fire Insurance Policy 501
How To Read the Official Airline Guide 509
The 24-Hour Clock 503

HARCOURT, BRACE & WORLD, INC.

English 2600 – English 3200 152
Mathematics Enrichment 414
Poetry: A Closer Look 209
Programed Instruction 547
Steps to Better Reading 235
Student Guide with Programed Units for
  Hilgard's Introduction to Psychology -

HARPER & ROW
Introduction to Basic Principles of Modern Mathematics 405
Learning and Human Abilities 697

D. C. HEATH AND CO.

Programed Genetics 650
Programed Introduction to Linguistics, A 218

HOLT, RINEHART & WINSTON, INC.

Arithmetic of Directed Numbers 41
Chemical Formulas -
China: A Programed Unit in Geography 706
Classification of Matter -
Equations and Inequalities 323
Gases: Gas Laws 669
Gases: Kinetic-Molecular Theory of Gases 667
Introduction to Coordinate Geometry -
Introduction to Sets 440
Laws of Chemical Change; Dalton's Atomic Theory -
Program in Contemporary Algebra, A 340

HONOR PRODUCTS CO.

Africa	702
Age of the Dinosaurs, The	575
Amphibians and Reptiles	577
Bird Migration	581
Building Words	240
Elementary Arithmetic–Addition I, Subtraction I	3
Elements of the Weather	583
Fun with Words	164
Fundamentals of Rockets and Space Travel	589
Hawaii–More Than an Island Paradise	721
Introduction to the Universe	620
Mathematics in Action	412
Persuasive Words	213
Primer on Manners, A	-
Power Prose	-
Solving Arithmetic Word Problems	355
Spelling Magic	-
Spelling Power	-
Study Skills	745
Word Clues	250
Wonderful World of Insects, The	638

HORNUNG-SON PUBLICATIONS CO.

Building Materials & Methods of Construction	497

INRAD–P.O. Box 4456, Lubbock, Texas

Algebra, Your Personal Tutor in	-
Algebra I, Your Personal Tutor in	-
Charts & Graphs, Your Personal Tutor in	-
Fractions, Your Personal Tutor in	-
Number Concepts, Your Personal Tutor in	-
Signed Numbers, Your Personal Tutor in	-
Spelling, Your Personal Tutor in	-

INSTITUTE OF EDUCATIONAL RESEARCH, INC.

Basal Progressive Choice Reading Program	222

GERALD L. JENSEN

Constitution of the United States, The 712

LEARNING FOUNDATIONS INSTITUTE, INC.

Atoms, Electrons and the Structure of Matter 657
French I 262
How To Remember Faces and Names 515
Multiplication, Division, Squaring -

LEARNING INCORPORATED

Biggest Reptiles, The: Alligators and Crocodiles 579
Division by Zero—Impossible! 49
Experiments with Sound 585
Flower Parts 587
How To Follow the Stock Market 505
How To Get Along with Your Bank Statement 511
How To Watch a Football Game 142
Members of Congress, The 732
Music Makers 531
Our Two Newest States 741
Photosynthesis 648
Roller Skating Safety 146
Synonyms, Antonyms, Homonyms 174
Theory of Sets 452

LORD PRODUCTS, INC.

Conducting an Interview 95
Cutting Office Costs Through Work Simplification 99
Improving Your Written Communications 107
Increasing Productivity Through the Supervisor 109
Putting Public Relations to Work 120

MACMILLAN COMPANY

Bases and Numerals 47
Clear Thinking -
Factors and Primes 399
From the Naturals to the Reals -
Modular Systems -
Number Sentences 333

MACMILLAN COMPANY (continued)

Points, Lines, and Planes	384
Points, Lines, and Space	-
Programmed English	166
Programmed Instruction in Economics (5 volumes)	739
Sets, Operations, and Circuits	448
What Are the Chances?	473

McGRAW-HILL BOOK COMPANY

Accounting Process, The	80
Analysis of Behavior, The	-
Decimals and Percent	10
Finite Arithmetic	55
Fractions	21
Introduction to Groups and Fields, An	407
Introduction to Probability, An	462
Logical Electronic Troubleshooting	-
Numeration Systems and Scientific Notation	373
Programmed Business Mathematics	114
Programmed Course in Basic Electricity, A	551
Programmed Introduction to Statistical Concepts, A	469
Programmed Reading	229
Sets, Equations, and Inequalities	446
Sets, Relations, and Functions	450
Writing Russian Script	288

METHUEN & CO., LTD.

Earth in Orbit	714
Logarithms	-
Simultaneous Equations	353

MODEL PUBLISHING COMPANY

Consumer Finance	97
Mathematical Language of Science, The	367
Radioactivity From Roentgen to Rockets	525

NOBLE AND NOBLE, PUBLISHERS, INC.

Arithmetic with Sets & Arithmetic in Use	431

PAKDONALD PUBLISHING CO.

Binary System, The	-
Geography of England, The	-
Gremlins and the Scientific Method	-
How To Calculate Interest on Time Payments	-
How To Find Percentages	-
How To Measure Board Feet	507
How To Use the Micrometer	-
How To Use the Slide Rule	-
Introduction to Marxist Economic Analysis, An	-
Perceptive Thinking	-
Pronoun, The	-
Some Useful French Phrases	-
There, Their, They're	-
Time in Music	-
To, Two, Too	-

PRENTICE-HALL, INC.

Cobol	-
Introduction to Chemical Concepts	673
Programming the IBM 7090	-
Selected Principles of Chemistry	687
Transistors	-

PROGRAMMED TEACHING AIDS, INC.

Basic German Vocabulary	268
Intensified Algebra R-1	325

PUBLISHERS COMPANY

Arithmetic	-
Reading	231

RCA EDUCATIONAL SERVICES

Basic Symbolic Logic	388
Programed Guide to Writing Auto Instructional Programs, A	539

SCHOLASTIC MAGAZINES, INC.

Self-Teaching Arithmetic Books	65

SCIENCE RESEARCH ASSOCIATES, INC.

How To Use the Microscope 614
Introduction to Nuclear Energy 618
Matter and Atomic Structure 677
Measuring Length in Metric Units 624
Modern Mathematics: A Programed Textbook, Course 1 417
Wff: Beginner's Game of Modern Logic 390
Wff 'N Proof: The Game of Modern Logic 392
Words 254

SPRINGER PUBLISHING CO., INC.

Arithmetic for Nurses 361

TEACHING MATERIALS CORPORATION

Advanced Mathematics Series; Introductory Statistics. Part I: Descriptive Statistics; Part II: Statistical Inference 454
Bridge 132
Elementary Arithmetic Series—Addition and Subtraction Facts 6
Elementary Arithmetic Series: Decimal Numbers 14
Elementary Arithmetic Series: Fractions; Basic Concepts 19
Elementary Arithmetic Series: Introduction to Numbers 51
Elementary Arithmetic Series: Multiplication & Division Facts 71
Elementary Arithmetic Series: Time Telling 53
Fundamentals of Music 529
General Science Series: Biology and Chemistry 600
General Science Series: Measurement, Meteorology & Astronomy 603
General Science Series: Sound, Light, Electricity & Communications 605
General Science Series: Work and Machines 607
Intermediate Mathematics Series: Introduction to Modern Mathematics 401
Intermediate Mathematics Series: Modern Mathematics: Number Systems 403
Modern English Series: First Steps in Reading 226

TEACHING MATERIALS CORPORATION

Modern English Series: Punctuation 178
Modern English Series: Spelling Rules 194
Modern Language Series: Basic German Reading 274
Modern Language Series: Basic Russian Reading 285
Modern Language Series: Basic Spanish 295
Modern Language Series: Modern Hebrew: Basic Reading 278
Secondary Mathematics Series: Algebra Refresher 343
Secondary Mathematics Series: Fundamentals of Algebra I & II 346
Secondary Science Series: Chemistry: Matter and Chemical Change 683
Secondary Science Series: Fundamentals of Electricity, D.C. 555
Secondary Science Series: Fundamentals of Human Physiology 652
Stenospeed, An "ABC" Shorthand 126

TRAINING SYSTEMS, INC.

Basic Memory Training 491
Gyro Fundamentals 571

UNIVERSAL TEACHING MACHINE INSTITUTE

Algebra—U-3001 318
Algebra—4001 & 4002 -
Arithmetic U-3008 38
Arithmetic—4003 & 4004 -
Better Study Habits 743
Business Arithmetic—4005 -
English—4006, 4007 & 4008 -
English Grammar U-3003 157
French—4009 & 4010 -
General Science—4011 & 4012 -
General Science U-3004 609
Geography—4013 & 4014 -
Geography of the United States U-3006 716
Geometry—4015 -
History—4016 & 4017 -
History of the United States—U-3005 723
Spanish—4018 & 4019 -

UNIVERSAL ELECTRONICS LABORATORIES CORP. (continued)

Spanish U-3002	303
Spelling—4020, 4021 & 4022	-
Spelling U-3007	202
Study Skills—4023 & 4024	-

UNIVERSITY MICROFILMS, INC.

Beginning Chess	140

U.S. INDUSTRIES, INC., Educational Science Division

Basic Map Reading	-
Computers	363
Diabetes Control (For Doctors)	483
Elementary Electronics	569
First Year Electronics (Vol. I-V)	567
Fractions	28
Improving Your Writing	211
Introduction to Algebra	308
Introduction to Computer Mathematics	359
Punctuation	180
Short Course in Effective Executive Practices	101
Slide Rule Fundamentals	-
Taking Care of Diabetes	489

VAN VALKENBURGH, NOOGER & NEVILLE, INC.

Basic Electronics	563
Basic Industrial Electricity (Vol. I & II)	553

VARIAN ASSOCIATES

Backward Wave Oscillators	-
Decibels	-
Capacitance & Capacitors	557
Klystrons	573
Introduction to Klystrons, Multicavity Klystrons & Reflex Klystrons	-
Magnetrons	-
Microwave Hardware	-
Microwave Measurement	-
Reading a Micrometer	-
Reading Production Drawings	-
Relays	559
Switches	561
Traveling-Wave Tubes	-
Using a Dictating Machine	-

WELCH SCIENTIFIC CO.

Programed Introduction to the Periodic Chart of the Atoms 681

JOHN WILEY & SONS, INC.

Medical Terminology 487
Programmed Beginning Algebra 335
Programmed Introduction to Vectors 693

JAY A. YOUNG

Liquids and Solutions 675

ADDENDA

TEACHING SYSTEMS CORPORATION

Business Mathematics -
The Electoral System -
The Metric System -
Driver Training -

SUBJECT MATTER INDEX

ARITHMETIC

Addition and Subtraction

Addition and Subtraction, A Set of 11 Automated Workbooks 1
*Analyzing Addition Graficroll
Elementary Arithmetic, Addition and Subtraction I 3
Elementary Arithmetic Series: Addition and Subtraction Facts 6

Decimals and Percents

Decimals 8
Decimals and Percent 10
Decimals and Per Cents 12
Elementary Arithmetic Series: Decimal Numbers 14
*How to Find Percentages PakDonald
Problems in Percentage 17

Fractions

*Addition of Fractions Graflex, Inc.
Elementary Arithmetic Series: Fractions: Basic Concepts 19
Fractions 21
Fractions 23
Fractions I & II 25
Fractions, A Basic Course in Arithmetic 28

---

*Sample frames were not submitted and data on this program are not included in the body of the book.

Fractions (continued)

Fractions, A Set of 14 Automated Workbooks		30
Fractions with Meaning	Graficroll	
Understanding Fractions		32
* Your Personal Tutor in: Fractions	INRAD	

Miscellaneous Arithmetic

* Arithmetic	Publishers Company	
Arithmetic I and II		34
Arithmetic 22		36
*Arithmetic—4003 & 4004	Universal	
Arithmetic U-3008		38
Arithmetic of Directed Numbers		41
390 Arithmetic Facts		43
Arithmetic of the Whole Numbers		45
Bases and Numerals		47
* Basic Operations and Understandings	Graficroll	
* Discovering Patterns in Arithmetic Sequence: Number Progression and Number Digression (Two Volumes)	Graficroll	
Division by Zero—Impossible!		49
Elementary Arithmetic Series: Introduction to Numbers		51
Elementary Arithmetic Series: Time Telling		53
Finite Arithmetics		55
General Mathematics 40		57
Lower Primary Arithmetic, A Set of 10 Automated Workbooks		59
Number Facts, Part I: Addition & Subtraction; Part II: Multiplication & Division		61

---

*Sample frames were not submitted and data on this program are not included in the body of the book

Miscellaneous Arithmetic (continued)

*The Number Line	Graficroll	
Ratios & Proportions		63
Self-Teaching Arithmetic Books, Knowledge Master Books Scholastic Magazines, Inc.		65
* Time Telling	Graflex, Inc.	
Upper Primary Arithmetic, A Set of 13 Automated Workbooks		67
Whole Numbers and Numerals		69
* Your Personal Tutor In: Number Concepts	INRAD	

Multiplication and Division

* Analyzing Multiplication & Advanced Analyzing Multiplication	Graficroll	
Elementary Arithmetic Series: Multiplication & Division Facts		71
Foundations of Multiplication and Division		74
Multiplication Box		76
Multiplication and Division, A Set of 9 Automated Workbooks		78
* Multiplication, Division, Squaring, Primary Grades Arithmetic	Learning Foundations Institute	

BUSINESS EDUCATION & ECONOMICS

The Accounting Process, A Programmed Text		80
Principles of Accounting		82
Bank Teller Training Course		86
Beginning Bookkeeping		88
*Better Selling	Colortone Press	

BUSINESS EDUCATION & ECONOMICS (continued)

*Business Arithmetic—4005	Universal Teaching Machine Institute
Business Law	91
Student Workbook to Accompany Challenge in the American Economy, Part I	93
*COBOL Programed Text	Burroughs Corporation
*COBOL, A Self Instructional Programed Manual	Prentice Hall, Inc.
Conducting an Interview (No. 5 in the Management Skills Series)	95
Consumer Finance, Credit Judgment	97
*Corporation Finance	Hamilton Research Associates
Cutting Office Costs Through Work Simplification (No. 4 in the Management Skills Series)	99
Effective Executive Practices	101
Fundamentals of Finance and Investment	103
Improving Your Written Communications	107
Increasing Productivity Through the Supervisor	109
Insurance Premium Financing	111
*IVE Leadership Manual	Colortone Press
Programmed Business Mathematics: Concepts, Skills & Applications H.S. +	114
Programmed Instruction in PERT and CPM	118
Putting Public Relations to Work (No. 2 in the Management Skills Series)	120
The Salesman's Call Report	122
Shorthand 33	124
Stenospeed, an "ABC" Shorthand	126
Value Control, Value Engineering & Value Analysis	130

GAMES

Bridge 132
Elements of Bridge 134
Contract Bridge for Beginners 136
How to Score Bowling 138
Beginning Chess 140
How to Watch a Football Game 142
Numismatics, A Guide for Coin Collectors 144
Roller Skating Safety 146

GRAMMAR & USAGE

Basic English 37 148
English I and II 150
English 2600 (Revised Edition) & English 3200 152
*English—4006, 4007 & 4008 Universal
English Grammar 28 155
English Grammar U-3003 157
English Usage 160
*Everyday American English Electronic Teaching Laboratories
Figures of Speech 162
Fun with Words, Homonyms—Sound Alike Words 164
Programmed English, A Modern Grammar for High School and College Students 166
*The Pronoun PakDonald

---

*Sample frames were not submitted and data on this program are not included in the body of the book.

GRAMMAR & USAGE (continued)

Strengthening Grammatical Concepts		168
StudenTutor Library of Sentences Words, References		171
Synonyms, Antonyms, Homonyms		174
*There, Their, and They're	PakDonald	
*To, Two, Too	PakDonald	

Punctuation & Capitalization

Achieving Clarity Through Punctuation		176
Modern English Series: Punctuation		178
Proper Punctuation		180
Punctuation & Capitalization 26		182
Using Capital Letters		184
Using Punctuation		186

Spelling

Beginning Spelling		188
Improving Your Spelling		191
Modern English Series: Spelling Rules		194
Spelling Demons, I and II		198
Spelling Improvement 18		200
*Spelling Magic	Honor	
*Spelling Power, Clues to Better Spelling	Honor	
*Spelling—4020, 4031 & 4022	Universal	

Spelling (continued)

Spelling U-3007		202
*Your Personal Tutor in: Spelling	INRAD	

LANGUAGE ARTS

Fundamentals of Poetry		205
The Meaning of Modern Poetry		207
Poetry: A Closer Look		209
Effective Writing		211
Persuasive Words, Effective Word Usage		213
*Phonetics I & II	Graficroll	
*Power Prose, Essentials of Writing	Honor	
Principles of Debate		215
A Programmed Introduction to Linguistics, Phonetics & Phonemics		218
StudenTutor Library of Matching Exercises		220

Reading

The Basal Progressive Choice Reading Program		222
How To Improve Improve Your Reading		224
Modern English Series: First Steps in Reading, A Programed Reading Primer		226
Programmed Reading		229
*Reading, Graded Programs, 5th-12th Grade Vocabulary	Education Engineering, Inc.	
Reading, Word Recognition		231
Remedial Reading, A Set of 16 Automated Workbooks		233
Steps to Better Reading		235

Vocabulary

Beginning Sight Vocabulary 237
Building Words, Structural Analysis of Words 240
David Discovers the Dictionary 242
StudenTutor Library of Vocabulary Enrichment 244
*Use of Dictionary Guide Words — Graflex, Inc.
Vocabulary Building I and II 246
Vocabulary Growth, Divide and Conquer Words 248
Word Clues, Be a Word Detective 250
Word Clues, Books G, H, I, J, K, L, and M 252
Words, A Programed Course in Vocabulary Development 254

MODERN LANGUAGE

Elementary French 257
French (Elementary), CLT French Series 1 (No. 16-12-03) 260
French I, Short-Cut in Vocabulary Building 262
*French—4009, 4010 — Universal
French Phonetics 264
French TravaTutor 266
*Some Useful French Phrases — PakDonald

Basic German Vocabulary 268
*German — Electronic Teaching Laboratories
German A 270
German TravaTutor 272

---

*Sample frames were not submitted and data on this program are not included in the body of the book.

MODERN LANGUAGE (continued)

Modern Language Series: Basic German Reading 274
Modern Language Series: Modern Hebrew: Basic Reading 278
Italian TravaTutor 281
Japanese TravaTutor 283
Modern Language Series: Basic Russian Reading 285
*Russian Electronic Teaching Laboratories
Writing Russian Script 288
Automated Spanish 290
Introductory Spanish 293
Modern Language Series: Basic Spanish 295
Spanish A, First Year Course in Spanish 299
*Spanish—4018 & 4019 Universal
Spanish (Elementary), CLT Spanish, Series I (No. 16-12-04) 301
Spanish U-3002 303
Spanish TravaTutor 306

MATHEMATICS

Algebra (see also: Sets; Miscellaneous Math)

Adventures in Algebra 308
Algebra I 310
Algebra II 312
Algebra I and II 314
Algebra 11 316

Algebra (continued)

*Algebra—4001 & 4002 Universal
Algebra U-3001 318
Algebraic Equations 321
Equations and Inequalities 323
Intensified Algebra R-1 325
Introduction to Algebra 327
An Introduction to Verbal Problems in Algebra 329
The Language of Algebra, Fields and Ordered Fields 331
Number Sentences, An Introduction to Equation Spelling 333
Programmed Beginning Algebra 335
A Program in Contemporary Algebra 340
Secondary Mathematics Series: Algebra Refresher 343
Secondary Mathematics Series: Fundamentals of Algebra, Part I & II 346
Simultaneous Equations 353
Solving Arithmetic Work Problems 355
Vector Algebra 357
*Your Personal Tutor In: Algebra INRAD
*Your Personal Tutor In: Algebra I INRAD

Applied Mathematics

The Arithmetic of Computers 359
Arithmetic for Nurses 361
Basic Computer Programming 363
Cobol, Computer Language (see Business Ed.)

---

*Sample frames were not submitted and data on this program are not included in the body of the book.

Applied Mathematics (continued)

Mathematical Bases for Management Decision Making, Matrices and Mathematical Programming		365
The Mathematical Language of Science, The Measurement of Space, Time and Matter		367
Measurement in the Metric System		369
Numbers and Units for Science		371
Numeration Systems and Scientific Notation		373
Practical Mathematics		375
*Advanced Slide Rule, Log Log Scales	Graficroll	
*How to Use the Slide Rule	PakDonald	
*Slide Rule Fundamentals	Educational Science Division, U.S. Industries	
The Slide Rule		377
*Your Personal Tutor in: Charts & Graphs	INRAD	

Geometry

Applied Geometry 36		379
Geometry	Graficroll	
*Introduction to Coordinate Geometry	Holt, Rinehart & Winston	
Plane Geometry		382
Points, Lines, and Planes, An Introduction to Geometry in Two Dimensions		384
*Points, Lines, and Space, An Introduction to Geometry in Three Dimensions	Macmillan	
Solid Geometry		386

Logic

Basic Symbolic Logic		388
*Clear Thinking, An Introduction to Logic in Mathematics	Macmillan	
WFF, The Beginner's Game of Modern Logic		390
WFF 'N PROOF, The Game of Modern Logic		392

Mathematics (Miscellaneous)

Basic Mathematics		395
Basic Mathematics, A Problem-Solving Approach		397
*The Binary System	PakDonald	
*Computing Square Roots	Graflex, Inc.	
Factors and Primes, An Introduction to Number Theory		399
*From the Naturals to the Reals, An Introduction to Number Systems	Macmillan	
Intermediate Mathematics Series: Introduction to Modern Mathematics		401
Intermediate Mathematics Series: Modern Mathematics: Number Systems		403
Introduction to Basic Principles of Modern Mathematics		405
An Introduction to Groups and Fields, A Programmed Unit in Modern Mathematics		407
Introductory Calculus, Part I and Part II		409
*Logarithms	Methuen	
Mathematics in Action, Understanding Number Systems		412

---

*Sample frames were not submitted and data on this program are not included in the body of the book.

Mathematics (Miscellaneous) (continued)

Mathematics Enrichment, Sets, Numeration, Geometry 414
Modern Mathematics: A Programed Textbook, Course I 417
*Modular Systems, An Introduction to Structure in Mathematics Macmillan
Number Bases and Binary Arithmetic 427
Seventh Grade Mathematics 429
*Your Personal Tutor In: Signed Numbers INRAD

Sets

Arithmetic with Sets, Book 4, Progressive Elementary Mathematics Series: Arithmetic in Use, Book 5, Progressive Elementary Mathematics Series 431
Introduction to Sets 440
An Introduction to Sets, Inequalities, and Functions, Introduction to Analytic Geometry 442
Language of Sets 444
Sets, Equations, and Inequalities 446
*Sets and Numbers Graficroll
Sets, Operations, and Circuits, An Introduction to Set Theory 448
Sets, Relations, and Functions, A Programmed Introduction to Modern Mathematics 450
Theory of Sets 452

Statistics

Advanced Mathematics Series: Introductory Statistics, Part I: Descriptive Statistics; Part II: Statistical Inference 454

Statistics (continued)

Descriptive Statistics, A Behavioral Approach 457
Elementary Statistics, Part I: Descriptive Statistics 460
An Introduction to Probability 462
*Introduction to Probabilities Graflex, Inc.
Introductory Descriptive Statistics, with Applications to Psychology 464
Probability and Statistics—A Programmed Course of Instruction 466
A Programmed Introduction to Statistical Concepts 469
Statistics: Probability Models of Random Processes 471
What Are the Chances? 473

Trigonometry

Analytic Trigonometry 475
Trigonometry, A Practical Course 477
Trigonometry I and II 479
Trigonometry (Plane) 481

MEDICINE

Diabetes Control (For Doctors) 483
Medical Physiology for the Home 485
Medical Terminology, A Programmed Textbook 487
Taking Care of Diabetes 489

---

*Sample frames were not submitted and data on this program are not included in the body of the book.

MISCELLANEOUS

Basic Memory Training		491
Black and White Inspection		493
Black and White Printer Training Program		495
Building Materials & Methods of Construction		497
Color Inspection		499
*Color Printing	Hamilton Research	
*Detecting Counterfeit Money	Educational Methods, Inc.	
Fire Insurance Policy		501
The 24-Hour Clock		503
*How To Calculate Interest on Time Payments	PakDonald	
How To Follow the Stock Market		505
How To Measure Board Feet		507
How To Read the Official Airline Guide, Quick Reference Edition		509
How To Get Along with Your Bank Statement		511
How To Be More Creative		513
How To Remember Faces and Names, A Practical Application of Psychology		515
*How To Use the Micrometer	PakDonald	
*Reading a Micrometer	Varian	
Interior Decoration		517
*Introduction to Color Concepts	Graflex, Inc.	
Learning the Dialogue Mass, For Children, Adults and Mass Servers		519
Official Girlwatcher's Manual		521
*Perceptive Thinking	PakDonald	
Practical Law, A Course in Everyday Contracts		523

MISCELLANEOUS (continued)

*A Primer on Manners, Gaining Social Confidence	Honor	
Radioactivity from Roentgen to Rockets, Fallout Protection		525
*Reading Production Drawings	Varian	
*Safe Driving, Self-Taught	Fearon	
*Using a Dictating Machine	Varian	
*Your Life Insurance	Doubleday	

MUSIC

Fundamentals of Music		529
Music Makers		531
Musical Notation		533
*Time in Music	PakDonald	

PROGRAMING

Applications of Programed Instruction		535
Explaining "Teaching Machines" and Programming		537
A Programed Guide to Writing Autoinstructional Programs		539
*Preparing Objectives for Programed Instruction	Fearon	
Programed Instruction, The Process		541
Programed Instruction: A New Approach to Teaching & Learning		543
Programed Instruction and Programing Technique, A Manual for Programers		545
Programed Instruction, What It Is and How It Works		547

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*Sample frames were not submitted and data on this program are not included in the body of the book.

PROGRAMMING (continued)

A Programed Primer on graming (Vol. I & II)		549

APPLIED SCIENCE

Electricity

*Backward-Wave Oscillators	Varian	
A Programmed Course in Basic Electricity		551
Basic Industrial Electricity		553
Secondary Science Series: Fundamentals of Electricity		555
Capacitance & Capacitors		557
Relays		559
Switches		561
*Transistors	Prentice Hall, Inc.	

Electronics

Basic Electronics		563
Basic Electronics 07		565
First Year Electronics		567
Introduction to Electronics		569
*Logical Electronic Trouble-shooting	McGraw-Hill	
*Magnetrons	Varian	
*Microwave Hardware	Varian	
*Microwave Measurements	Varian	
*Programming the IBM, A Self-Instructional Manual	Prentice Hall	

Miscellaneous Applied Science

*Decibels	Varian	
Gyro Fundamentals		571
Klystrons		573
*Introduction to Klystrons, Multicavity Klystrons & Reflex Klystrons	Varian	
*Radio Wave Motion	Colortone	
*Traveling-wave Tubes	Varian	

SCIENCE

General Science

The Age of the Dinosaurs, Life 100 Million Years Ago		575
Amphibians and Reptiles		577
The Biggest Reptiles: Alligators and Crocodiles		579
Bird Migration		581
*Classification of Plants	Graflex, Inc.	
Elements of the Weather, Reasons for Weather Conditions		583
Experiments with Sound		585
Flower Parts		587
Fundamentals of Rockets and Space Travel, Introduction to The Space Age		589
*General Science—4011 & 4012	Universal	
General Science Programmed Learning Laboratory, Matter in Motion, Flow of Energy, Structure of the Universe, Patterns of Life, Science at Work		591
General Science Series: Biology and Chemistry		600
General Science Series: Measurement, Meteorology & Astronomy		603
General Science Series: Sound, Light, Electricity and Communications		605
General Science Series: Work and Machines		607
General Science U-3004		609
*Gremlins and the Scientific Method	PakDonald	

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General Science (continued)

Grouping Animals: What Is a Mammal? 612
How To Use the Microscope 614
How We Forecast the Weather 616
*Introduction to Entomology Graflex, Inc.
Introduction to Nuclear Energy 618
Introduction to the Universe 620
Latitude and Longitude 622
*Life Cycle of Insects Graflex, Inc.
*Measurements and Units, An Introduction for Science Appleton Century Crofts
Measuring Length in Metric Units 624
A Program on Earth-Sun Relations 626
Our Solar System 628
Science I and II 630
Space Science 632
Telling Time from the Rocks 634
*Trees, Their Uses and Structures Graflex, Inc.
*Using Clouds to Predict Weather Graflex, Inc.
Water as a Natural Resource 636
The Wonderful World of Insects 638

Biology

*Asexual Reproduction in Plants Graflex, Inc.
Cells, Their Structure and Function 640
Human Anatomy & Physiology 642
Muscles, Nerves and Bones of the Head 644
Photosynthesis 648
Programed Genetics, The Basic Concepts 650
Secondary Science Series: Fundamentals of Human Physiology 652
Spermatophytes 654

Chemistry

Atoms, Electrons and the Structure of Matter (Unit I of Complete Atomic Theory & Its Applications) 657
Chemical Bonding 659
*Chemical Formulas Holt, Rinehart & Winston
Chemical Mathematics 661
Chemistry I, Atomic Structure and Bonding 663
Chemistry Concepts, The Molar Method 665
*Classification of Matter Holt, Rinehart & Winston
Gases: Kinetic-Molecular Theory of Gases 667
Gases: Gas Laws 669
Gas Laws 671
Introduction to Chemical Concepts 673
*Laws of Chemical Change; Dalton's Atomic Theory Holt, Rinehart & Winston
Liquids and Solutions 675
Matter and Atomic Structure 677
*The Mole Concept in Chemistry Graflex, Inc.
Principles of Chemistry 679
A Programed Introduction to the Periodic Chart of the Atoms 681
Secondary Science Series: Chemistry: Matter & Chemical Change 683
Selected Principles of Chemistry 687

Physics

Action of Forces 689
Hydrostatics 691
*Linear Motion Graficroll
A Programed Introduction to Vectors 693
*Vectors Graficroll
Vectors, A Programed Text for Introductory Physics 695

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Psychology

*The Analysis of Behavior	McGraw Hill	
Learning and Human Abilities (An Adjunct Program for the Text)		697
Physiological Psychology, An Introductory Psychology Unit		700
*Student Guide with Programed Units for Hilgard's Introduction to Psychology	Harcourt, Brace & World	

SOCIAL STUDIES

Africa, The Awakening Giant		702
*American Heritage	Graficroll	
*Basic Map Reading	Educational Science Division, U.S. Industries, Inc	
The Bill of Rights		704
China: A Programed Unit in Geography		706
The Constitution		708
Constitution of the United States		710
The Constitution of the United States		712
Earth in Orbit (Geography, Part I)		714
*Our Earth and the Universe	Graflex, Inc.	
*The Earth's Surface	Graflex, Inc.	
*Geography—4013-4014	Universal	
*The Geography of England	PakDonald	
Geography of the United States		
*The Geography of England	PakDonald	
Geography of the United States U-3006		716
Great Themes in American History, 1760-1860 & 1860-1960		719

SOCIAL STUDIES (continued)

History—4016 & 4017		721
*History of the United States U-3005	Universal	
History of the United States U-3005		723
How a Bill Becomes Law		726
How We Prosper, An Introduction to the American Economy		728
*An Introduction to Marxist Economic Analysis	PakDonald	
Maps: How We Read Them		730
The Members of Congress		732
Parliamentary Procedure		734
Parliamentary Procedure 29		736
Programmed Instruction in Economics (5 volumes)		739
Our Two Newest States		741

STUDY SKILLS

Better Study Habits		743
*Study Skills—4023 & 4024	Universal	
Study Skills, Guide to Efficient Study		745
Study Skills for Home Use		747
*Technical Skills in Research Paper Preparation	Encyclopaedia Britannica Press	
Your Study Skills		751

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